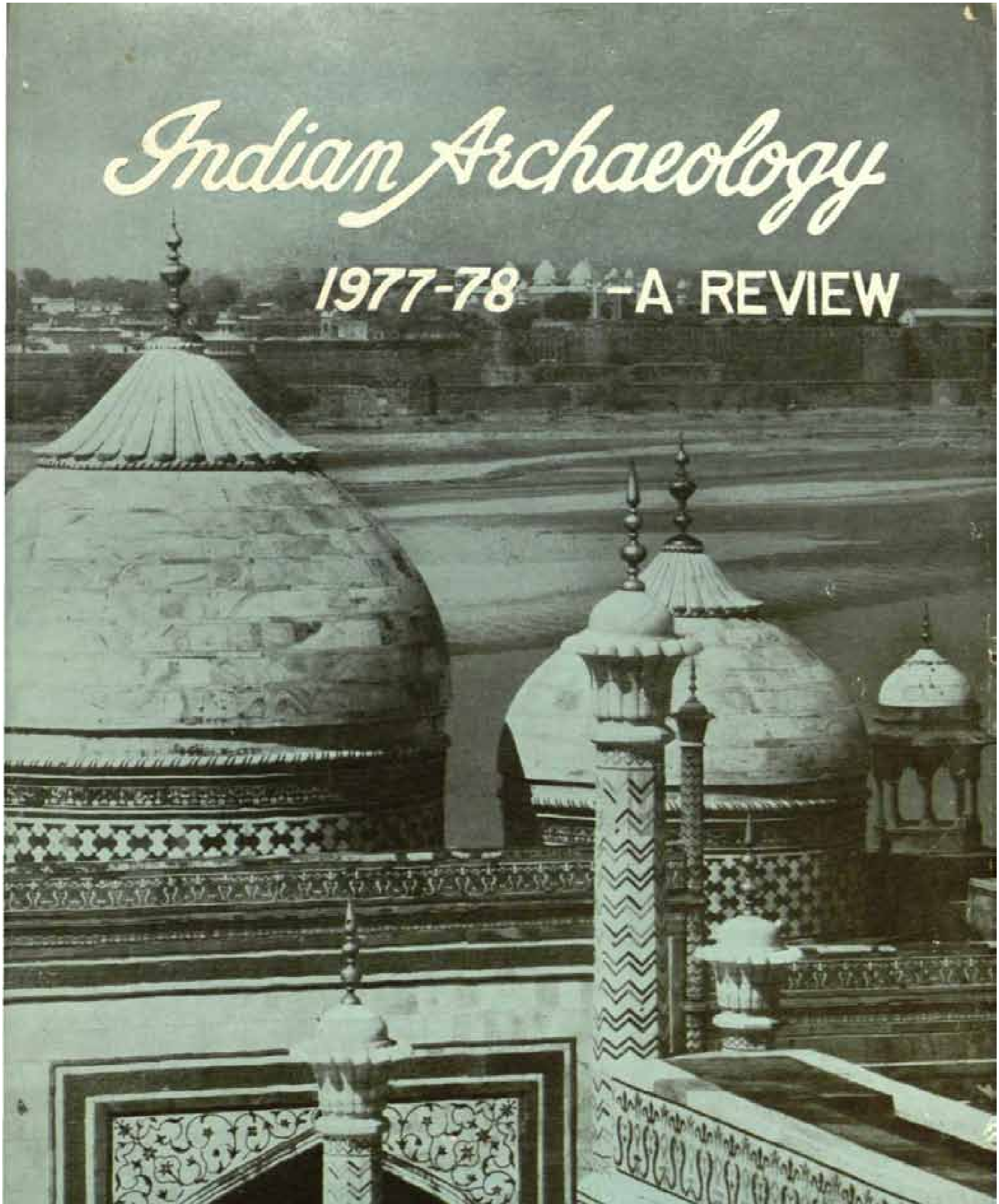

Indian Archaeology
1977-78 -A REVIEW

INDIAN ARCHAEOLOGY 1977-78
- A REVIEW

EDITED BY

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ARCHAEOLOGICAL SURVEY OF INDIA
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PREFACE

With the publication of this issue, the *Review* would have completed twenty-five years of its existence, and it is a matter of no mean gratification that it has fulfilled its primary function as a report, surveying the antiquarian work in the country. During these eventful years, its content has grown with the manifold activities of the Archaeological Survey of India and the development of multi-disciplinary studies. That it has been found as a useful tool of research, presenting Indian archaeology currently to the world, is amply reflected by the concern shown by various scholars, both in India and abroad, for clearing its arrears, into which it had unfortunately fallen since 1962-63. The prefatory notes in the issues of the subsequent years have no doubt explained the sustained efforts made by us to clear the backlog; with the publication of the present issue we would be behind-hand by only one issue, which is almost press-ready. For all this endeavour, I am particularly beholden to my colleagues in the Survey who have toiled hard to achieve the target.

As usual I am grateful to all the contributors, both from the Survey and also from the various State Departments of Archaeology and other Institutions, for sending their material for publication in the *Review*.

New Delhi
31 July 1980

B. K. THAPAR

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INDIAN ARCHAEOLOGY 1977-78

-A REVIEW

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ANDHRA PRADESH

1. EXPLORATION IN DISTRICT ANANTAPUR.—In the course of exploration, Sarvashri P. B. S. Sengar, Basheer Khan, A. J. Nambhiraju and O. B. Khobragade of the Prehistory Branch of the Archaeological Survey of India[1] discovered neolithic habitation sites at Dayyalan-kuntapalle, Hampapuram (Gollapalle) and Krishnamareddipalle, yielding plenty of tools of the pecked and ground stone industry, showing various stages of manufacture, besides a large number of microliths and handmade pottery of thick fabric.

2. EXPLORATION IN DISTRICT CUDDAPAH.—Sarvashri P. B. S. Sengar, A. J. Nambhiraju and Basheer Khan of the Prehistory Branch of the Survey in the course of exploration of a part of the valley of the river Pennar and its tributaries, discovered a number of Lower and Middle Palaeolithic and Mesolithic sites. Besides, they observed interesting river-sections yielding large number of Stone Age tools from stratified deposits. The stratigraphy observed from top down wards was: red silt; yellowish kankary silt; pebbly gravel; lateritic boulder conglomerate; laterite; and bed-rock.

3. EXCAVATION AT DONGALASANI, DISTRICT CUDDAPAH.—The Department of Archaeology and Museums, Government of Andhra Pradesh, conducted excavation on a small mound at Dongalasani. The excavation revealed a brick-built temple (brick size: 41-5 x 6-5 cm) consisting of a *garbhagriha* (2-15 x 1-45 m), *antarala, mukhamandapa* and *prakara,* with an entrance (0-75 m) on the east. An inscription of Vankaya Choda *maharaja* of Telugu Choda family, belonging to *circa* tenth century A.D., mentioning the deity as Kuruba Bhattari, was recovered from the excavation.

4. EXPLORATION IN DISTRICTS GUNTUR, KRISHNA AND PRAKASAM.—Dr K. Krishna Murthy of the South-eastern Circle of the Survey discovered in the course of exploration a Buddhist site at Nambur and vestiges of Buddhistic establishment on the top of the hill (Vijayakiladri) with random rubble revetment along the summit of the hill at Seethanagaram in District Guntur.

Further, assisted by Sarvashri G. V. Sreenivasa Rao and P. Seetharama Murthy, he discovered an extensive early historical site along the Annangi hill near Annangi in District Krishna. The site yielded large quantity of pottery including black-and-red, black-polished, red wares and Rouletted Ware, besides a lead coin, probably belonging to the Ikshvaku dynasty, terracotta figurines and terracotta pear or areca nut-shaped and o/^/fl-shaped beads. Besides, a cluster of megalithic burials of cairn-circle type was also noticed on a hill near Manikeswaram.

Sarvashri C. L. N. Sastry and P. Seetharama Murthy, in their village to village survey for antiquarian remains in Districts Krishna and Prakasam respectively, discovered the following sites.

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[1]The Archaeological Survey of India is referred to in the following pages as the 'Survey' .

(NEO = NEOLITHIC CULTURE ; MEG = MEGALITHS ; EH = EARLY HISTORICAL ; EM = EARLY MEDIEVAL ; = LATE MEDIEVAL; BDS= BUDDHIST SITE; BRW = BLACK-AND-RED WARE; BW — BLACK WARE; RW = RED WARE; IP = INSCRIBED POTTERY; AND NC = NATURAL CAVES)

District	*Taluk*	*Village/Site*	*Cultural assemblage*
Krishna	Nandigama	Adaviravulapadu	EH, RW
-do-	-do-	Anasagaram	MEG
-do-	-do-	Bobbellapadu	NEO, EH, BRW, BW, RW
-do-	-do-	Chintalapadu	EH, BRW
-do-	-do-	Kammavaripalem	EH, RW
-do-	-do-	Kandrapadu	EH, BRW, RW
-do-	-do-	Kommavarapupad u	EH, BRW, RW
-do-	-do-	Muppalla	EH, RW
-do-	-do-	Pallagiri	LM
-do-	-do-	Raghavapuram	EH, BRW, BW, RW
-do-	-do-	Satyavaram	EH, RW
-do-	-do-	Totaravulapadu	EM, RW
Prakasam	Addanki	Ambadipudi	EM
-do-	-do-	Anamanamuru	LM
-do-	-do-	Baitamanjulur	EH, IP
-do-	-do-	Boggukonda (Kukutapalli)	NEO
-do-	-do-	Daivalaravuru	EM
-do-	-do-	Darmavaram	MEG, EH, EM, IP, NC
-do-	-do-	Dhenukonda	EH, EM, IP
-do-	-do-	Doddavaram	LM
-do-	-do-	Doddikonda (Mukteswaram)	EM
-do-	-do-	Elchur	NEO, EH, IP
-do-	-do-	Ghadiyapudi	LM
-do-	-do-	Gopalapuram	EH, LM, IP
-do-	-do-	Gopalapuram-Agraharam	LM
-do-	-do-	Guntupalle	NEO, MEG
-do-	-do-	Ilapavulur	EH, LM, IP
-do-	-do-	Jangamaheswarapuram	MEG
-do-	-do-	Kalavakur	EH, EM, IP
-do-	-do-	Kondamunjaluru	EM, LM
-do-	-do-	Konidena	NEO, EM, IP
-do-	-do-	Kottakota	LM
-do-	-do-	Kukutlapalle	EH, BDS
-do-	-do-	Kundurru	EH, EM, IP
-do-	-do-	Manikeswaram	MEG, EH, EM, IP
-do-	-do-	Medarametla	NEO, EH, IP
-do-	-do-	Mukteswaram	EH, LM, IP
-do-	-do-	Nannurpadu	EH, EM, IP
-do-	-do-	Perayapalem	LM
-do-	-do-	Ramkur	LM
-do-	-do-	Singarakonda	LM
-do-	-do-	Tellapadu	EH, LM, IP

District	*Taluk*	*Village/Site*	*Cultural assemblage*
Prakasam	Addanki	Timmayapalem	EM
-do-	-do-	Vellalacheruvu	EH, IP
-do-	-do-	Vaidana	EH, LM, IP
-do-	Darsi	Mylavaram	EH
-do-	-do-	Uppalapadu	EH, IP
-do-	-do-	Vemparala	EH, EM, IP
-do-	Ongole	Annangi	EH, IP

5. EXCAVATION AT NELAKONDAPALLY, DISTRICT KHAMMAM.—The Department of Archaeology and Museums, Government of Andhra Pradesh, conducted excavation on the mound called Bairagi-gadda and exposed four irregular brick-walls plastered with lime. The digging yielded three copper coins issued by Vishnukundin kings and lead coins bearing elephant symbols which may be ascribed to Ikshvaku period. Nine mutilated sculptures, recovered earlier from the site by the villagers, were shifted to State Museum at Vijayawada.

6. EXPLORATION IN DISTRICT KURNOOL.—Dr K. Krishna Murthy, assisted by Sarvashri B. P. Bopardikar and D. Hanumantha Rao of the South-eastern Circle of the Survey, explored the area around Ketavaram and noticed rock-shelters belonging to the prehistoric period with paintings in the Erramallai hills. The paintings depict both animals and birds like deer, antelope, peacock, etc., in red pigment and occasionally in black, while those of the later period are represented by geometric designs including symbols. Dr Murthy also noticed some epigraphical evidences in Brahmi script of third-fourth century A.D. He also located a habitation site, datable to first-second centuries A.D., immediately in front of the rock-shelters, locally known as Siddula Gavulu. The site showed three terraces in different levels, all provided with random rubble revetments. Vestiges of structural activity of both brick (56 X 28 X 9 cm) and rubble are extant on the topmost terrace. The surface finds of the site include flakes and crescents of chert and chalcedony, red and black wares.

7. EXCAVATION AT SATANIKOTA, DISTRICT KURNOOL.—The Excavations Branch (I) of the Survey, Nagpur, under the direction of Shri N. C. Ghosh, assisted by Dr H. N. Singh, Sarvashri A. K. Sharma, P. R. K. Prasad, H. P. Sinha, D. K. Ambastha, A. K. Ghosh, Mohinder Singh, N. G. Banerjee, S. V. Sutaone, P. M. Bhope, R. K. Dwivedi, S. J. Moriya, K. M. Grihe, R. K. Roy, M. U. Qureshi, Sardar Pyara Singh and A. U. Ganar, carried out excavation at Satanikota, located on the right bank of the Tungabhadra in Nandikotkur Taluk (pl. I), the objectives of the excavation being to ascertain the cultural and historical sequence of the area threatened with submergence as a result of the Srisailam Irrigation Hydel Project. The excavation brought to light a fortified township belonging to the Satavahana period.

In all, seven cuttings were laid in different parts of the mound. Of these, cutting SKT-1 was laid in the western part to obtain a west-east cross-section *vis-a-vis* the sequence of cultures and remains of structures, if any. It formed the main section and its principal discovery includes a massive fortification-wall and moat. STK-2, 3 and 4 were taken up along the western and the southern periphery of the mound to trace further the plan of the fortifications. While STK-3 yielded an elaborate gateway-complex, STK-2 and 4 revealed the extension of the fortification-wall and the moat. STK-5, 6 and 7 were in the nature of soundings to probe cultural deposits

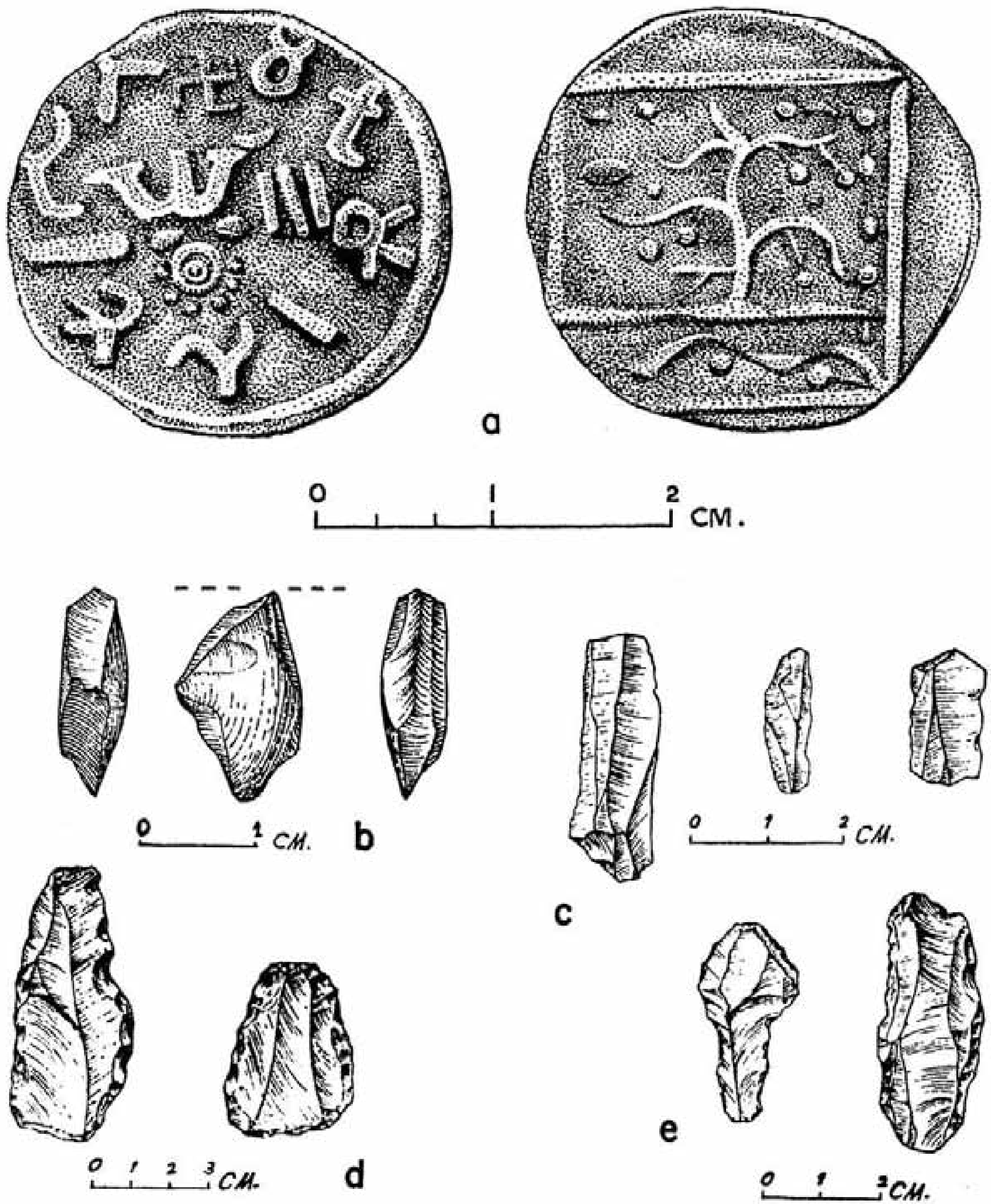


FIG. 1. *a-b, Satanikota : seal and burin : c, Suddaqudam : microlith; d-e, Tekra: microliths*

in the northern part of the mound which is now occupied by the modern village. The site revealed three main cultural periods of occupation.

Period I (Mesolithic Age) is characterized by the occurrence of microliths comprising scrapers, blades, backed blade, a burin (fig. 1 b) and a large number of flakes and flake-tools. These tools, unassociated with pottery or any other objects, were recovered from the top of gravel bed lying above the decomposed rock *in situ* which in turn rests on bed-rock. There is no stratification in the gravel bed. It is evident thus that the Mesolithic people had appeared long after the formation of gravel.

Period II (middle of the first century B.C. to the middle of the third century A.D.) represents the chief occupational period and fall mainly into three phases: I, II A and II B. The fortification-wall together with the moat and the gate formed the main structural activities of phase I. The builders of the fort appear to have followed the contour of the natural elevated ground. As a result thereof an unconventional plan of the fortifications could be obtained. The existence of the fort-wall could be established partially on the western and the eastern periphery, while on the southern side a considerable stretch of the wall with a gateway was exposed. The inhabitants had utilized the river and inaccessible escarpment, rising to a height of nearly 9 m from its bed on the north-eastern side of the settlement, for their defence. No bastions could be noticed in the fortifications.

The main fortification-wall is built of Cuddapah slabs of irregular dimensions laid in mud mortar. It measures 3.20 m in width with about 10 to 13 extant courses. It is a free built wall, raised immediately over the top of the red patinated gravels. It has been provided with 1-45 m wide baked brick facing (pl. II A) standing to a maximum extant of five courses laid in mud mortar (brick size: 56 X 28 X 8 cm).

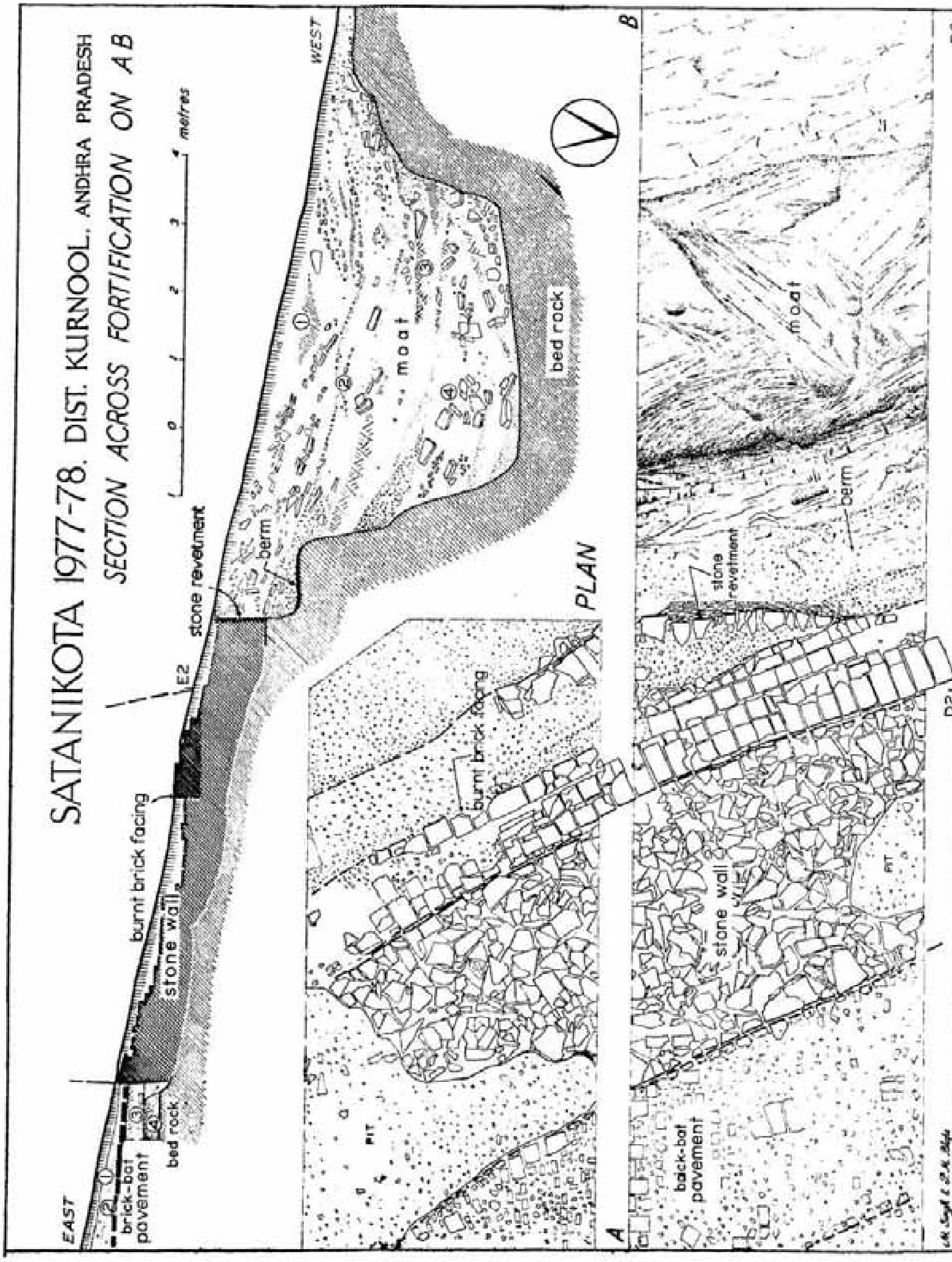
On the inner side along the main wall was found a 3.20-m wide pavement made of brickbats over the top of the red patinated gravels.

The fortification-wall is skirted by a rock-cut moat (fig. 2) quarried into the natural bed-rock, as evidenced by extensive chisel marks. The average depth and width of the moat are about 3.20 and 4.25 m respectively. The excavation has, however, not been able to indicate the mechanism to fill the moat with the water of the river Tungabhadra.

The elaborate gateway-complex facing south is by far the most outstanding architectural part of the entire fortification-complex. Placed in the southern arm of the fortification, it is charaterized by a flight of five steps with a width of 3 m which is flanked by 0.45 m wide north-south running parapet walls partly of baked bricks and stones. Each tread measures 1.10 m while the riser is 0-23 m. While small flat stones of irregular sizes have been used for paving the run of the stairway, the edges of risers have, however, been dressed with bricks. Three pairs of sockets (0.37 m dia.) cut into blocks of stones and distributed evenly on either side of the gate are available in the following arrangement. The first set, one in each side of the flanking stones, inside the gate, was carved to carry two leaves of the door. Another set of two sockets was found on either side of the outer edge of the gateway-complex and almost perched on the inner edge of the moat (pl. Ill A). These were probably meant for heavy posts of a draw-bridge which was used for crossing the moat to approach the gate. Evidence for a permanent arrangement to negotiate the gate over the moat is not available.

The fortification had undergone repairs at many points. The baked brick facing on the east of the stairway was slightly shifted inside, almost overlapping the stone wall. At places, the brick facing of the stone wall was repaired with small flat pieces of stone or boulders laid in mud mortar. The south-west corner was buttressed with a wall of small flat stones and the intervening space was packed with hard earth and *muram.* In one instance even *muram* was rammed in to fill the breach.

Structural activity within the fort commences nearly 12 m away from the fort-wall. An extensive structural complex covering an area of about 300 sq m and comprising a couple of



SATANIKOTA 1977-78, DIST. KURNOOL, ANDHRA PRADESH
SECTION ACROSS FORTIFICATION ON A B
metres
EAST
WEST
brick-bat pavement
bed rock
stone wall
burnt brick facing
E2
stone revetment
berm
moat
bed rock
PLAN
A
B
burnt brick facing
PIT
brick-bat pavement
stone wall
stone revetment
berm
moat
D2
D3

FIG. 2

rectangular rooms and enclosures, measuring on an average 1.95 X 2.65 and 3.20 X 4.45 m respectively, has been retrieved only in the form of robber's trenches. The baked brick walls have been practically obliterated due to systematic robbing of bricks, except at a few spots. It was noticed that the foundation trenches for the house-walls were dug quite deep into the underlying deposit of red patinated gravels and packed with gravels in the matrix of hard clay. A series of post-holes have also been noticed on the walls, probably to carry some wooden members.

The structural phase IIA of Period II is represented mainly by a rectangular structure of baked bricks and a series of baked brick structures. The former is represented by three brick-built walls, forming a portion of a structure oriented east-west. Inside the structure were found two stone slabs. It is a free-built structure. To the east of the above, another structure of baked bricks was encountered. The bricks are laid in mud mortar mixed with grit, right on the top of the red patinated gravels.

Further east of the above, the later construction (pl. II B) is represented by a series of three baked brick (50 X 26 X 8 cm) built structures (A, B and C). Major portions of these structures were below the ground-level and were provided with tiled roofs. Structure 'A' was built of well-baked bricks in mud mortar mixed with grit. All the thirty-seven courses of bricks of this structure were laid without any set pattern of bonding. It is rectangular on plan measuring 2.10 (E-W) X 1.47 (N-S) m with a depth of 3 m from the topmost course. The bottom is paved with full-sized bricks. A large number of brick-bats, perforated tiles, iron nails and a few potsherds were recovered from the debris within the pit.

Structure 'B' is situated 1.33 m east of 'A'. It is also rectangular on plan. At the top, it measures 1.38 (E-W) X 1.28 (N-S) m. The depth from the top course is 2-82 m, involving as many as thirty-three courses of bricks. The structure rests on the bed-rock, and has yielded quite a

^C ■ brick-bat \vi
>/ ■; pavement if-'-

good number of complete pots containing ashy deposits and bones.

Further east is located structure 'C in the same alignment. It is almost square on plan, measuring 1.06 X 1.10 m with a depth of 4.10 m from the top-course, showing as many as forty-eight extant courses paved with brick-bats instead of complete bricks. Immediately north of the above structure a damaged structure (1.02 X1.33 m) of identical plan was also exposed.

The roofs of these structures appear to have been built of tiles (overlapping), as evidenced by the collapsed debris. They are mainly of three varieties, viz., flat, eave and ridge tiles, and the finials. The flat (pl. IVA) ones have a pair of holes in the upper edge to hold the nails which too have been recovered in large numbers.

<M Small t£°Ji.MjU

Phase II B is represented by remains of a damaged brick-paved platform (1.36 X 1.50 m) with post-holes and a room (2.52 X 2.22 m) with partly paved drain. The walls of the latter structure carry a number of post-holes. A huge stone-slab covering the brick-floor was found in the centre of this structure.

The principal ceramics of the Period, comparable with other Satavahana sites, include: black-and-red ware, Rouletted Ware (pl. IV B), Russet-coated Painted Ware, Kaolin ware, red polished ware (fig. 3), chocolate-slipped ware, besides the usual slipped and unslipped red and black wares. The black-and-red ware is represented by burnished and unburnished fabrics. The former, noted for its bright shining surface, is represented largely by dishes and bowls, and in some instances betray affinities with the megalithic Black-and-red Ware of the region. In a few cases, the pots are externally black and internally red, while in other cases the outer and inner surfaces of the bottom are black while the rim and sides are red. A few sherds of the dishes of the Rouletted Ware bear concentric circular bands instead of roulettes. However, its total yield is very meagre. Occurrence of the Russet-coated Painted Ware accounts for 0.02 per cent of the total assemblage. The types represented in this Ware are bowls and dishes. The painted designs include: criss-cross, lattice, radiating dots, verticals alternating with dots and group of oblique lines. Kaolin ware is very scarcely represented, forming a meagre 0.002

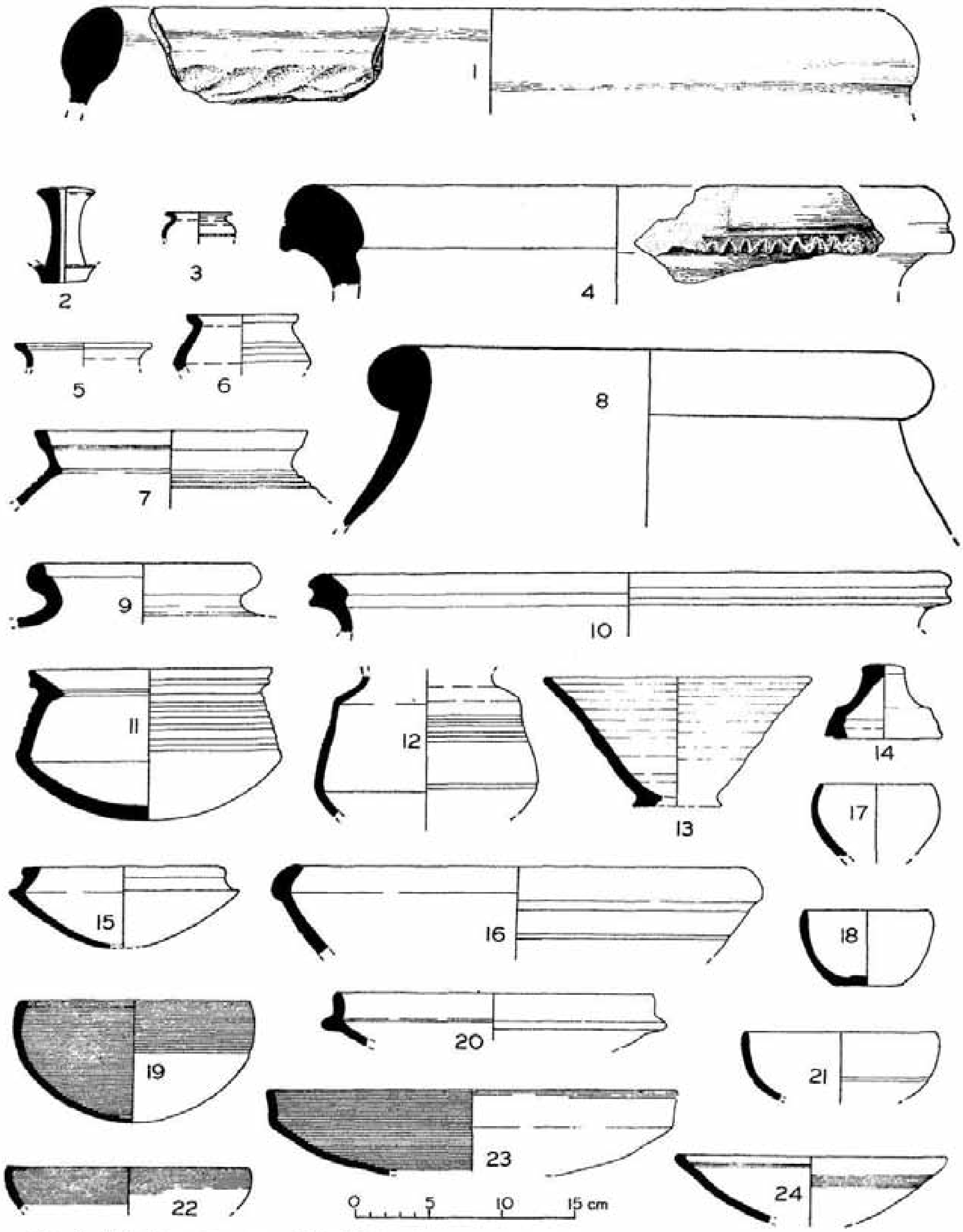


FIG. 3. *Satanikota, pottery types: 1, 3, 13-14, red ware, 2, red polished ware, 4-6, 8-10,12, 16-18, 20-21, 24, red-slipped ware, 19, 22-23, black-and-red ware, Period II; 7, grey ware, 11, 15, black ware, Period III*

per cent of the total assemblage. The sprinklers, which are usually available in red polished ware, are also represented in this ware. The red polished ware is represented by 3.4 per cent of the total ceramic yield. The incidence of chocolate-slipped ware is throughout uniform, being represented by a good number of large-sized basins and troughs. The slipped variety of the red ware, accounting for 30.72 per cent of the yield, is represented by storage jars carrying designs and decorations (fig. 4) including traditional symbols like *triratna,* besides, dishes, bowls, basins, troughs and vases. The decorations are made either by incision, stamping or applique method. The unslipped red ware represents 22.86 per cent of the collection, having mainly two types, viz., deep bowls and dishes. No decorative pattern is available in this ware. Slipped black ware is represented mainly by bowls and dishes; the types, however, are having their analogues in the red and black-and-red wares. The unslipped variety of black ware presents a large assortment of types including carinated *handi,* lid-cum-bowl, wide-mouthed heavy rimmed jars and *lotas.*

Important find of the period is a solitary lead coin (pl. IV C) of a hitherto unknown king *Siri Sata Kumara* (fig. la). The legend is in early Brahmi characters of *circa* first century B.G.-A.D. On the obverse it depicts a *triratna* to the left and three vertical lines adjacent to it on the right. A contra-clockwise *svastika,* a *nandipada* and a crescent are shown in a group over the above symbols. The legend *Siri Sata* on the left and *Kumarasa* on the right is around the symbols. The reverse portrays a fruit-bearing tree enclosed within a square; a wavy line with two pellets in lower curves is depicted below the tree within a border. Among other objects, mention may be made of: legged querns, mullers, marbles and a few architectural fragments in stone; a ring in gold studded with a piece of lapis lazuli; rings and bangles in copper; bangle, ring, nail, spearhead, sickle, etc. in iron; bangles and rings in shell and glass; and bone points. Amongst terracotta objects, a solitary example of female head (pl. IV D) with its headdress typical of the Satavahana period tied in the form of crocodile heads on either side *(chudamani makarika)* over the top of the head is quite interesting. It is made of double mould. As many as two hundred beads have been recovered. Of these, glass alone accounts for nearly fifty per cent followed by terracotta (twenty-five per cent). Shell, carnelian (eight specimens), agate (six examples), jasper (ten numbers), bloodstone (two beads), chert (one), opal (one) and bone (one) are the other materials used for manufacturing beads of different shapes (pl. IV E). A noteworthy discovery is a turtle-shaped pendant of shell. Besides, three neolithic celts were found in unstratified context and a few from the surface.

Period III (Medieval) is marked by the occurrence of fragmentary stone walls and damaged floors. The habitational deposit of the Period is subjected to such an extensive pit activity that the potteries and antiquities of the preceeding Period II have got mixed up with those of this Period, as a result of which a clear picture has not emerged. The ceramic industry of this Period is represented by plain and unslipped red ware, grey and deep-black wares. Carinated vessels, lid-cum-bowl, cup, dish, wide-mouthed heavy rimmed jar, vase and *lota* are some of the popular shapes. Vases in deep-black ware with grooved patterns and stamped designs around the neck recall typical examples from the Medieval Period at Maski. The red ware is often painted in red on white. Important antiquities recovered include: three medieval coins; a stone plaque of Lakulisa; an image of Ganesa, a broken piece of halo in red sandstone (pl. IV F), carved with lotus design on the border; a cache of ill-baked terracotta animal figurines such as bull, horse, boar (?), ram; and a few exotic play-objects.

Documentation inside the village revealed architectural remains of Chalukyan times including a Siva temple, watch-tower and a gate. The temple with a *mandapa, antarala* and *garbhagriha,* however, has undergone alterations and additions from time to time. It is not under worship. The watch-tower is located just at the edge of a cliff overlooking the river Tungabhadra and as such occupies a very commanding position. Built on rectangular plan, it measures 4.55 X 3.50 m. The gateway-complex is characterized by a wide passage and high flanking

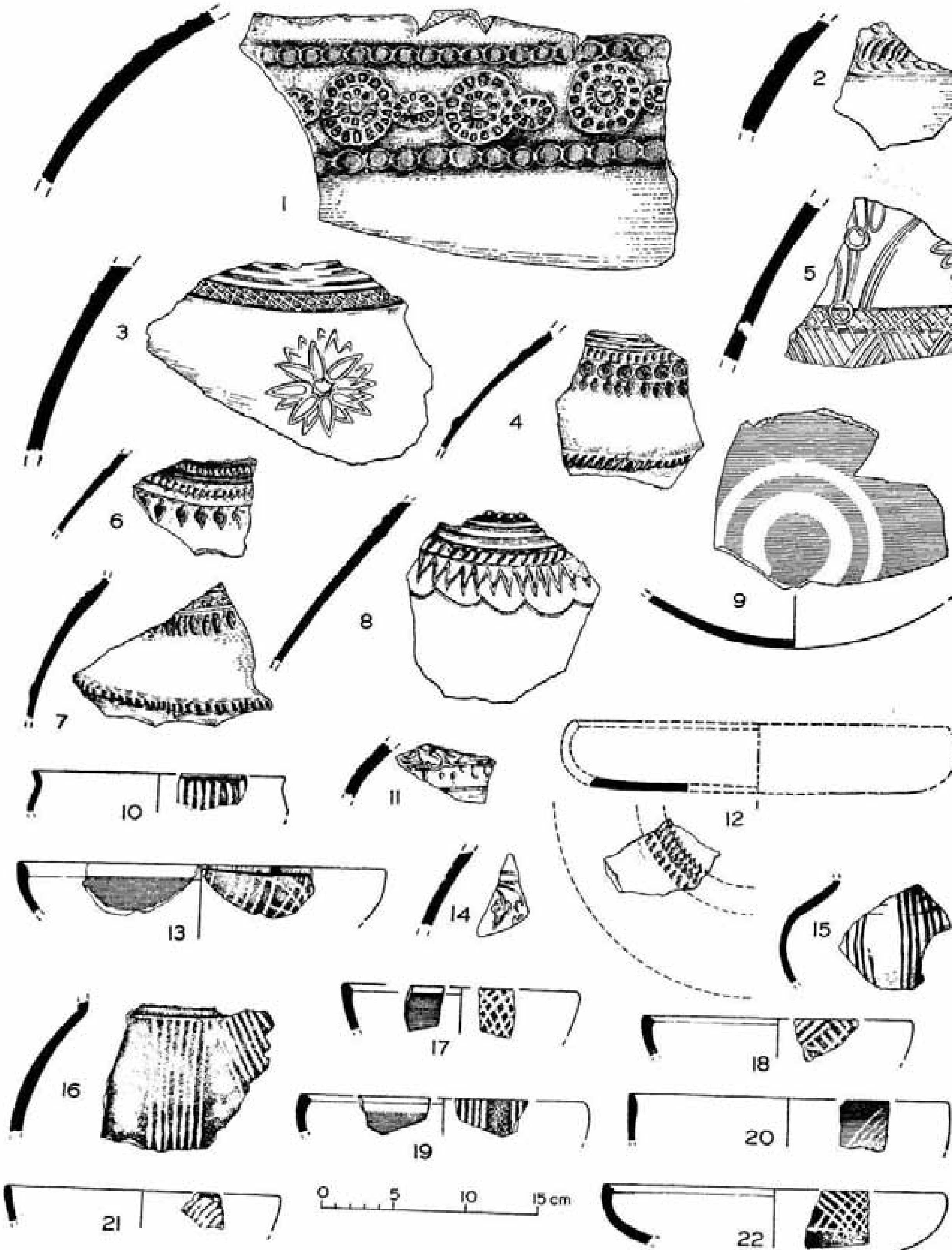


FIG. 4. *Satanikota, pottery types: 9-12, Rouletted Ware, 10, 13, 16-22, Russet-coated Painted Ware, 1-3, 5-11, 14, decorated sherds, Period II; 15, painted sherd, 4, 6-8, decorated sherds, Period III*

walls with insets on either side for guards. The gate was regulated by two doors, front and rear. This structure, too, shows subsequent repairs. All the three structures are built of dressed stones. Documentation of archaeological remains outside the village brought to light more than one cluster of megalithic burials (pl. III B), about 2 km east of the village, on a high ground away from the bank of the Tungabhadra. Of these, one cluster, labelled 'A', has nine burials of cist-circle type with orthostats arranged in clockwise pattern. The cists in some cases seem to be transepted by an upright slab. A short passage flanked by two slabs and closed in front by another slab leads to the post-hole on the southern orthostat. The capstones of these burials are missing as they have been damaged by the villagers. The cist-burials are enclosed by a circle of triangular stone slabs. The space between the cist and the circle is packed with cairn packing. The diameter of the circles range between 10.10 and 5.30 m. Unlike Brahmagiri but like Maski, the major axis of all the cists is in north-south orientation.

8. EXCAVATION AT CHAGATUR, DISTRICT MAHBUBNAGAR.—The Department of Archaeology and Museums, Government of Andhra Pradesh, carried out excavation at Chagatur situated in between the rivers Krishna and Tungabhadra, as a result of which three cultural periods were brought to light.

Period I is represented by structures built of shale stone blocks. The ceramic industry of the Period is represented by red polished, black-and-red, black and red wares. Noteworthy antiquities of the Period include: terracotta male and female figurines, handmade and double-moulded; beads of terracotta, shell, stone; discs or spindle whorles of stone; ornaments in gold and silver; stylus or antimony rod in ivory.

Period II is also marked by structures built of shale stone blocks. The structures of this Period are built over those of the earlier ones. The ceramic industry of the Period is represented by dull-red and red wares, the types represented being conical bowls and spouts of sprinklers. Other finds recovered from the occupation debris include: beads and bangles of shell and terracotta; and iron objects like sickle, nail, etc.

Period III belongs to the medieval times, the relevant strata being very much disturbed. It is marked by the occurrence of grey ware. The antiquities recovered include: bangle pieces of glass; iron objects; beads of glass; and a coin issued by Humayun Shah Bahamani.

An interesting feature of the excavation was the existence immediately below the occupation of Period I of an implementiferous deposit yielding a few tools of Lower Palaeolithic age.

A megalithic burial site with dolmenoid cists with or without passage and stone-circles, was noticed about half a kilometre west of the above excavated site. One of the burials was excavated. The excavation revealed that the cist was made of four orthostats, arranged in clockwise pattern. The cist is divided by a transepting slab into eastern and western halves. Both the chambers are further sub-divided into northern and southern halves. The northern halves are provided with benches supported by vertical slabs. The chamber has a flooring-slab, over which a skull, some skeletal remains and a few red ware bowls were placed in the ashy deposit. A sprinkler in black polished ware and a few deep bowls in red ware were encountered in the southern halves. The port-hole on the southern orthostat of the cist is provided with a passage on the exterior, flanked by slabs and the front closed by another slab. The passage chamber too yielded fragments of skeletal remains and red ware sherds. There is one more port-hole on the southern orthostat, just below the above one, corresponding to the height of the bench inside. The orthostats are supported from outside by a platform of shale slabs, and the structure is enclosed by dressed stone-circle, and further enclosed by a rectangular chamber of rubble stone masonry (pl. V A) with an entrance on the south. Interesting feature of the burial (pl. V B) are four huge stone-slabs, erected on all the cardinal directions and occurrence of skeletal remains and megalithic red ware sherds outside the cist. Another noteworthy feature

is that the orthostats are decorated with bruised trident across the circle and endless cord design and rows of deep grooves. The most important find from the burial is a memorial stone, depicting the foot-prints exposed at the level of the stone bench.

A small-scale excavation at the mound locally known as Pydigutta, where a hemispherical stone structure looking like a dump of shale slabs, standing to a height of 4.57 m in an area of about 0-6 hectare, revealed three periods of occupation.

Period I is represented by burnished black and grey wares, microlithic blades and cores in jasper, quartz, etc., rubber stones, sling balls and a few steatite beads.

Period II is marked by the occurrence of brownish-grey, painted black-on-red wares, microlithic blades of jasper and quartz, steatite beads and a piece of copper.

Period III, datable to the early historical times, is represented by black-and-red, red and red polished wares, terracotta beads, glass bangles and iron pieces.

9. EXCAVATION AT UPPALAPADU, DISTRICT MAHBUBNAGAR.—The Department of Archaeology and Museums, Government of Andhra Pradesh, conducted excavation of sixteen megalithic burials in Sites 1, 2 and 3, where cist-and pit-burials were found segregated.

Excavation revealed that the Megaliths I, IV to IX from Site 1 and I, III to V from Site 2 are cairn-circles with rectangular pits oriented east-west, containing fragments of skeletal remains, vases of Black-and-red Ware, red, black wares and iron implements (pl. VI A). However, Megalith IV is an exception in having a slab-lined passage which is non-functional. Three coffin-shaped formations in which skeletal remains and ash deposit were found, may be degenerated wooden coffins (pl. VII A).

Megaliths II, III from Site 1 and VI from Site 2 and I from Site 3 are port-holed cists with or without passage. The four orthostats of the chamber are arranged in clockwise pattern, and either the southern or the western orthostat is provided with a port-hole. In some cases, the chamber is divided into two halves by a transepting slab, which is also provided with a port-hole. The burials yielded fragmentary skeletal remains, sherds of Black-and-red, red and black wares and iron objects (pl. VIII A).

Excavation of Megalith II in Site 2 revealed that it is a platform formed of small stone-circle, inside of which is paved with slabs of shale. No burial pit was encountered below the slab pavement.

10. EXCAVATION AT PEDDAMARRUR, DISTRICT MAHBUBNAGAR.—The Department of Archaeology and Museums, Government of Andhra Pradesh, carried out excavation at the habitation site and also megalithic burials in the vicinity. Excavation at the habitation site revealed two periods of occupation.

Period I, probably belonging to the Megalithic Culture or the early historical times, is marked by the occurrence of successive floorings, the earlier ones of rammed *kankar* and the latter floorings of shale slabs, circumscribed by post-holes, indicating the house patterns. The pottery of the Period consists of red polished, tan, black-and-red and black-polished wares. The buff ware is also represented by a few sherds. The common types are vase with beaded and flanged rim, deep bowl, dish, lid and narrow-necked vase with flanged rim. The antiquities recovered from occupational deposit of the Period include: pear-shaped and tabloid beads of terracotta; beads of jasper, carnelian, rock-crystal; bangles of shell, carved with round pellets and copper bangles, decorated with beaded design; and iron objects including arrowhead, spearhead, sickle and dish.

Period II, assignable to the Satavahana times, is marked by profuse usage of shale stone for constructions. The ceramic industry is dominated by red polished and coarse red wares. Other finds of the Period include: beads of terracotta, jasper, carnelian, rock-crystal; bangles of shell and copper; iron objects including socketed hoe and knives; and anoval-shaped stone

plaque, depicting a lion standing on a lotus with raised forepaw and tail curving upwards on the obverse, and the reverse divided into two panels by a wavy line enclosed by two bands, multiple arched-hill in the top panel and a lotus in the lower.

Excavation of the two megalithic burials from Group I, which is 2 km north of the village, revealed that the type represented is a port-holed cist with passage, bound by stone-circle. The port-hole and the passage are towards the south. The excavated burials in Group 2, lying 3 km south-west of the village, showed interesting features.

Megalith I is a cist, transepted into three chambers (pl. VII B) by two upright north-south oriented slabs. The port-hole is in the southern orthostat, leading internally to the central chamber and externally to an oblong passage closed by a slab in the front. The transepting slabs, too, are provided with port-holes. The eastern chamber (2.35 X 0.65 m) was tightly packed with pieces of shale slabs, quartzite and red clay up to a depth of 35 cm, below which only small chips of shale and rubble of quartzite packing was encountered. The funerary deposit, underlying the above packing, consisted of charred bones in urns, forty vases of Black-and-red Ware, black, red and coarse red wares, a small sickle of iron and two rock-crystal beads.

The central chamber yielded more than twenty-five vases in Black-and-red Ware, red, coarse red and polished red wares and a sarcophagus. Fragments of charred bones and calcined skull pieces were noticed along with some pots inside the sarcophagus. Removal of the flooring slab in between the eastern and central chambers revealed a burial-pit in the centre of the cist, yielding urns with bone pieces, ring-stands in black ware, a vase in red ware, a dish in Black-and-red Ware and a miniature pot in black ware. The western chamber, too, yielded a large number of vases and human bones at a depth of 1.35 m.

The cist is encircled by horizontally paved large and medium-sized slabs, the outer edge of which are trimmed into semicircular shape, so that they make a neat circle. The intervening space between the cist and the circle is filled with pieces of shale slabs.

Megalith II is a cist-burial (pl. VI B), the orthostats of which are arranged in contra-clockwise pattern. The port-hole, on the southern orthostat, closed externally by a slab, leads to a passage-chamber. The cist is transepted into two chambers by a vertical slab. The floor of the chambers are provided with slabs. The eastern chamber yielded four skulls, long bones, iron objects such as two rings, a spatula-like implement and a nail rivetted to a copper ring in the shape of spindle whorl, usual megalithic pottery, a terracotta figurine of buffalo besides a sarcophagus (pl. VIII B). The sarcophagus, covered with a lid, has two rows of six legs each and decorated with an applique band of finger impressions below the rim. It yielded a few bones only.

The western chamber contained a single skull, separately interred with three longer bones and two terracotta sarcophagi, besides pottery. Of the two sarcophagi, the one pentagonal in cross-section and truncated barrel-shaped, yielded a few fragments of charred skull bones, and the other one, decorated with double rows of multiple concentric lines, had a few bones and fragmentary skull, probably of a child.

Megalith III is a single-chambered cist, the orthostats of which are arranged in clockwise pattern. The port-hole on the southern orthostat opens to a passage-chamber. The cist is encircled by horizontally-paved slabs. The cist had no flooring-slab. But the funerary deposit was placed on the bed-rock itself. The interments include: eight skulls, few long bones and iron objects such as chisel, knives and triangular blade, probably used as arrowhead, besides usual megalithic pottery.

Megalith IV is a pit-burial but with a passage-chamber on the south, enclosed by double stone-circles of shale boulders. The skeletal remains were noticed at a depth of 1.80 m, deposited over the bed-rock. The pottery recovered is very scanty and damaged with the exception of a miniature pot in black ware.

11. EXCAVATION AT CALINGAPATNAM, DISTRICT SRIKAKULAM.—Dr K. Krishna Murthy of the South-eastern Circle of the Survey assisted by Sarvashri D. Hanumantha Rao and G. V. Sreenivasa Rao conducted a small-scale excavation on an ancient mound, situated near the sea shore at Calingapatnam. The excavation revealed the existence of an elaborate stupa datable to the first-second centuries B.C. The stupa with its hub and spokes is comparable to the one at Bhattiprolu of the same period. However, the date of this stupa is also corraborated by the size (56 X 28 X 9 cm) of the bricks and also the architectural feature of the stupa. The partial exposition of the stupa (pl. IX A) revealed three concentric rings or circles interlinked with spokes, and having a diameter of about 23 m with a proportionate height of 15 m.

The ceramic industry is represented by red, black-and-red, brown or chocolate-slipped wares and Rouletted Ware. The red ware is represented by bowls, dishes, carinated vases, sprinklers, etc., while the black-and-red ware is represented exclusively by dishes with incurved rims. Interestingly, a large number of Rouletted Ware dishes with internally chamferred rims and of orange or red and black or greyish shades are in evidence. A sherd of Rouletted Ware in black with eye-lash design is also among the collection.

The stupa exposed so far is bereft of any sculptural veneering which also indicates an early date for it.

BIHAR

12. EXCAVATION AT ANTICHAK, DISTRICT BHAGALPUR.—In continuation of the previous year's work *(Indian Archaeology 1976-77—A Review*[1], pp. 10-11), the Vikramshila Excavation Project of the Survey, under Dr B. S. Verma, assisted by Sarvashri B. N. Prasad, Satish Chandra Saran, A. Mukherjee, T. K. Srivastava, S. K. Chaudhary and Vijoy Shankar, resumed excavation at Antichak with a view to exposing the entire monastic complex which was partially excavated earlier.

The entire basement wall of the central shrine, which was found damaged by brick robbing, was exposed. The unexcavated portion in the southern wing of the quadrangle of the monastery was also excavated and the structures exposed.

Excavation outside the monastic complex, towards extreme north of the mound, revealed a brick temple (9.25 X 8.50 m) facing north with three small compartments (0.73 X 1.28, 1.0 X 1.50 and 0.73 X 1.03 m) and a verandah (5.80 X 1.70 m). The open space in front of the shrine measures 6.60 X 1.69 m. A large number of fragments of architectural members of an earlier temple were recovered in the excavation in the area.

In the excavation outside the monastery complex, towards north-east of it, a thick deposit of brittle potsherds, probably accumulated by rain water, was encountered in the earliest level. Over this debris were encountered shanty brick structures associated with ovens, pots, stone querns and pestles, etc. A circular well was also encountered in the area. Important finds from the area include: terracotta sealings; votive stupas; and beads of stone.

Excavation in front of the main gate, about 40 m north revealed a portion of the boundary (defence?) wall of the monastery and structures, belonging to three phases. A small gate (3.30 X 1.90 m) is provided in the boundary wall corresponding to the northern gate. The boundary wall was exposed to a length of 20 m to the east from the gate and 10 m to its west where it has been completely robbed. It was found that after the destruction of this wall, later structures were erected on its ruins. A shrine (1.33 X 1.23 m) with antechamber (3.23 X 2.29 m), belonging to a later phase, was exposed at a distance of 5-40 m from the gate. This shrine rests over an early structure (4.80 X 4.20 m), which was found disturbed. Similarly, towards west of the gate many damaged structures belonging to three phases were exposed.

[1]The above mentioned publication is referred to in the following pages by the year only.

Excavation outside the boundary wall, close to the gate, revealed a structure having twenty-five to thirty courses of bricks. The length of the northern wall is 25 m, whereas the eastern wall, provided with a flight of four steps (pl. IX B), was found robbed after a length of 21 m towards south. The southern wall of the structure could not be exposed as it is overlain by a flooring of later phase. However, western wall could be traced in the section of the trench. This structure seems to be contemporaneous with the boundary wall, as both rest on the natural soil, and perhaps represent the first phase of structural activity. Yet another shrine, constructed over filling of the debris was noticed. This small shrine was constructed of reused materials. Remains of small brick votive stupas were noticed around the shrine. The finds from the area include: sculptures of Lokesvara (pl. X A) and Tara (pl. XB) in black stone; torso of Nandi; Siva-Parvati in limestone; and two votive stupas (pl. X C) in stone. Other important antiquities recovered include: small image of Ganesa, head of Avalokitesvara (pl. XI A), *kirtimukha* (pl. XI B), terracotta plaques (pl. XI G) and sealings, votive stupas, beads in stone, ivory dice and small copper objects. One of the terracotta votive stupas bears inscription of eight words in Vaikhuni characters of ninth-twelfth centuries A.D.

13. EXCAVATION AT CHANDAHADIH, DISTRICT MUZAFFARPUR.—Dr Sita Ram Roy of the Department of Archaeology and Museums, Government of Bihar, assisted by Sarvashri Durga Nand Mishra 'Sudha', Krishna Kant Sharma, N. C. Ghosh, Jamil Akhtar, L. P. Singh, R. P. Singh and Uma Shankar Pandit, conducted excavation at Ghandahadih on the left bank of the river Bagmati, about 5 km north-west of Katragarh. An occupational deposit of 4·10 m representing two periods could be exposed. The natural soil, however, could not be reached due to high sub-soil water level.

Period I is represented by the Northern Black Polished Ware and other associated wares. Noteworthy antiquities from the Period include: beautiful terracotta plaques, animal and bird figurines, balls of various sizes, spindle whorls, ghata-shaped beads; weights and beads of semiprecious stones like carnelian, jasper, agate, rock-crystal, etc.; beads and pins of bone; bangle pieces of copper; and nails of iron. This period is datable to second century B.C. to first century A.D. on the basis of pottery and antiquities.

Period II is marked by the occurrence of red ware and the continuation of the grey ware from the earlier period. Structural activity is represented by remains of a flooring with intact pots, ovens, etc. Other finds recovered include: terracotta human and animal figurines, beads, pendants; beads of stone, glass and bone; bangle pieces of conch; and fragments of copper and iron objects.

14. EXCAVATION AT KATRAGARH, DISTRICT MUZAFFARPUR.—In continuation of the last year's *(1976-77,* pp. 12-13) work, Dr Sita Ram Roy of the Department of Archaeology and Museums, Government of Bihar, assisted by Sarvashri Durga Nand Mishra 'Sudha', Krishna Kant Sharma, N. C. Ghosh, Jamil Akhtar, Lakshman Prasad Singh, Rajendra Prasad Singh and Uma Shankar Pandit, resumed excavation mainly on rampart, and not only confirmed the results of the previous two seasons' work but also shed fresh light on the nature of defences.

Excavation revealed three phases of constructional activity of the fortifications which in the earliest phase was constructed of baked bricks (size: 40 X 24 X7 cm) and was provided with offsets at the bottom. The second phase is represented by a massive mud-core and a moat. The defence wall with sloping sides, of the third phase, built of baked bricks (size: 50 X 30 X 8 cm), is 2.60 m wide at the base. In the construction of the fortifications in first and third phases, alternate rows of headers and stretchers have been used. Two watch-towers, better preserved one at the centre and the other at the south-western corner of the defences, were exposed. A flight of steps in baked bricks, belonging to the first phase, leading to south-western watch-tower from the inner side of the fort was also exposed (pl. XII A). All the three phases of the

fortifications may be dated to the Sunga period on the basis of the antiquities discovered from the strata associated with them.

The ceramics unearthed from the site include red, black, grey wares and the Northern Black Polished Ware. Except a few handmade specimens in red ware, the entire range of pottery is turned on wheel. A few sherds in the red ware and the Northern Black Polished Ware show floral decorations and dotted circles impressed on them. Some sherds of red ware also show graffiti marks. The Northern Black Polished Ware occurred in many shades such as jet-black, golden, silver and metallic steel-grey. One sherd, however, showed red on one side and black on the other. The sherds of grey ware were generally treated with a wash and only occasionally with a slip. The pre-Sunga pottery which included the Northern Black Polished Ware and associated wares was picked up either from the pits or from unstratified layers or the layers below the Sunga period. The Kushana period too is represented by a few micaceous and rusticated red ware sherds and specimens having incised decorations around the neck of the vase. Other important antiquities recovered in the excavation include: terracotta objects such as plaques having male and female figures with elaborate coiffures and heavy ornamentation, figurines including male, female, couple, mother with child, ram, horse, elephant, bull, birds besides beads, whorls, toycart, wheel, dice, skin and corn rubbers, earlobes, potter's dabbers, etc.; beads of semi-precious stones such as carnelian, rock-crystal, jasper, lapis lazuli, etc.; bone objects including beads, pins, arrowheads, styli; uninscribed copper coins; and terracotta sealings.

15. EXCAVATION AT NALANDA, DISTRICT NALANDA.—In continuation of the last year's *(1976-77,* p. 13) work, Shri R. S. Bisht of the Mid-eastern Circle of the Survey, assisted by Dr Birendra Nath and Shri B. S. Jha, resumed excavation at the temple-site of the Sarai Mound.

The *garbhagriha* of the temple was fully cleared of the accumulated debris and the previously-exposed painted panels on the front face of the stone pedestal continue over the northern half also, whereas the side walls in the front half of the *garbhagriha* are devoid of any paintings. Continuous floral scrolls and a series of rosettes are found executed on the interior faces of the northern, southern and the back walls in the rear half (pl. XIII A). In contrast to the generally polychrome paintings, the floral scrolls are executed in black over white-washed lime plaster. Besides, human figures, sometimes superimposing one on the other, drawn only in black outlines are found on the smooth lime-flooring provided on the either side of the top surface of the stone pedestal. In the centre, was exposed a brick-built pedestal which is semi-circular in shape, adorned externally with a double row of lotus petals done in stucco. This pedestal might have supported a Buddha figure. No significant antiquities were recovered from the debris.

16. EXCAVATION AT APHSAD, DISTRICT NAWADAH.—Dr Prakash Charan Prasad, assisted by Sarvashri U. C. Dwivedi, Narayan Chandra Ghosh, Jamil Akhtar, Lakshman Prasad Singh and Raghunath Prasad Verma, under the guidance of Dr Sita Ram Roy of the Department of Archaeology and Museums, Government of Bihar, resumed *(1973-74,* pp. 10-11) excavation at a conical mound at Aphsad, probably representing the ruins of a Vishnu temple, built by the mother of Adityasena, a later Gupta king, as indicated by an inscription.

Excavation on the north-western side of the mound (pl. XIII B) revealed a structure, rectangular on plan, built in different diminishing tiers, the walls of which are provided with niches for stucco images. Each of the six tiers is provided with a *pradakshina-patha* plastered with lime and *surkhi.* Three brick-paved platforms, plastered with lime and *surkhi,* were noticed on the second tier. The walls of the tiers seem to have been decorated with stucco figures, as evident from the extant stucco figures depicting scenes from the *Ramayana* on the wall of the second tier.

Each tier was approached by a flight of steps. The bricks used throughout the construction measure 38 X 26 X 4 cm. Noteworthy antiquities recovered from the excavation include two small stone plaques probably of Vishnu of later date, terracotta beads, bird and lamps, stone beads, and a few sherds from the fillings.

17. EXPLORATION IN DISTRICT SINGHBHUM.—Dr Sita Ram Roy of the Department of Archaeology and Museums, Government of Bihar, assisted by Sarvashri Naseem Akhtar, Ram Janam Prasad, Krishna Kant Sharma, N. G. Ghosh and L. P. Singh, explored the valley of the river Bamini, a tributary of the river Suvarnarekha, from Bhalukocha to Bamini road-bridge, 2 km east of Pathardih. A implementiferous cliff-section showed (from bottom upwards) bed-rock, greyish blue clayey layer, gravel conglomerate with laterite pellets and large-sized boulders, silty clay, loose gravel and reddish clay. Besides, tools of Lower Palaeolithic age, including various types of scrapers, were picked up from the bed of the river at Bhalukocha, Pathardih, Pitakidih, Pusputul and Sasantand. The material used in the manufacturing of tools is mainly quartzite.

18. EXCAVATION AT CHECHAR-KUTUBPUR, DISTRICT VAISHALI.—Shri R. S. Bisht of the Mid-eastern Circle of the Survey, assisted by Sarvashri D. P. Sinha and A. N. Roy, conducted small-scale excavation at Chechar-Kutubpur on the northern bank of the river Ganga, with a view to ascertaining the cultural sequence of the site. The excavation yielded a three-fold cultural sequence.

The occupation strata of Period I is represented by compact deep yellow alluvium overlying the natural soil. Although no metals were recovered from any of the phases, the general evidence speaks of a developed rural economy in which agriculture as well as hunting, including angling, played an important role. Of the houses, post-holes, big and small, and burnt clay chunks bearing reed impressions suggest that people lived in huts made of wattle-and-daub, plastered over with husk-mixed earth. Though no house-plan could be exposed fully, the available evidence indicates that some of the houses were circular in plan. Successive mud-floorings are found to have been made of well-beaten earth, usually burnt red. Shallow depressions were observed in the floors which perhaps were caused by the constant placing of water-jars. Fire places dug into the flooring were encountered at the centre of the houses.

The pottery, in general, is made of well-levigated and fine to medium-grained clay; it is wheel turned and well fired. The slip is usually fine and thick and ranges from chocolate through crimson red, light red, orange to ochre in colour in red ware as well as on red portions of the black-and-red ware sherds. Grey ware is represented in tones of deep grey to blackish. In most cases, the surfaces were found dressed with burnishing which indeed was a distinct feature of the ceramics of the Period. Common shapes encountered include: small vase; small to medium-sized jar with sharply carinated neck-joint and out going and flared rim above neck; dish-on-stand; bowl with globular or ovoid body and outcurved or featureless rim, and sometimes having a ring base; and shallow and deep dish. Jars are usually made in two parts, with the neck portion carefully luted with the main body. Ochre painting, although generally restricted to thin bands on the rim, has been found throughout, contrary to the Chirand evidence. Polished stone tools (pl. XIV A) are also well represented. However, the divergences that exist within this Period are strong enough to justify the division into three phases A, B and C.

Period I A is dominated by red and grey wares with the latter occurring in lesser quantity. Interesting forms include a small vase with slightly straight neck and outcurved and everted rim, a deep bowl with outcurved rim and slight carination on the lower body, bowl with ring base, and a small piece of channel-spout with deep red band on its rim. A significant feature of this ware is the existence of applique designs on the shoulder, consisting of twisted rope, pinched, applique and cut patterns. A variety of tools made on bone and antler, including a double

forked pick-axe on antler (pl. XII B), having a meticulously carved socket hole for hafting, were also found. Besides, a few clay bins circular in shape and comparable to similar ones found at Sanghol (District Ludhiana, Punjab) and Banawali (District Hissar, Haryana) were also found/This phase is comparable to the neolithic period of Chirand.

Period IB is distinguished by the traditions of ceramics and house patterns of the preceding phase. The sophisticated bone and antler implements, however, are conspicuous by their absence, though ordinary bone tools and points do occur. Some of the pot-forms get modified; neck of a jar becomes fairly elongated and spouted vessels make their appearance. Significantly, the tops of the spout and the rim maintain one level.

Period I C is marked by innovations in pottery as well as in other finds. Grey and black-and-red wares increase in number, while red ware shows a lesser frequency. Besides, a fine and thin-walled black ware, having shiny black slip, makes its appearance and so do the white paintings in the form of straight or oblique strokes or dots. Contrary to the Chirand evidence, ochre painting not only continues but becomes more emphatic in the upper levels. Small *chalice*-cups on hollow or solid and short stems are common, and some of them show four thick bands, like *tilak,* on the interior surface of its bowl or on the exterior of the short stem. Among important finds mention may be made of micro-beads which, in shape, size, colour and cutting-technique, bear strong resemblance to the Harappan disc beads of steatite. But these are not as fragile as Harappan ones, and the material is still indeterminate.

Period II is marked by the appearance of the Northern Black Polished Ware with its associated wares. The black-and-red ware of the preceding phase continues but with certain changes. A huge pit, more than 2 m deep and 5 m wide, belonging to this phase was encountered. It yielded baked bricks and iron pieces.

Period III 'is represented by a large brick structure represented essentially by the ghost walls and four successive floor-levels. Nothing significant, except for an ordinary terracotta figurine, was recovered from the deposits of the Period. On the basis of pottery, this structure seems to have been constructed in the Kushana period and continued into the following Gupta period.

GUJARAT

19. EXPLORATION IN DISTRICT AHMADABAD.—Shri Ram M. Mirchandani, a Research Scholar from the M. S. University of Baroda, in the course of exploration in the above-mentioned District, located the following sites.

(EH=EARLY HISTORICAL; MES=MESOLITHIC; AND M=MEDIEVAL PERIOD)

District	*Taluk*	*Village/Site*	*Cultural assemblage*
Ahmadabad	Sanand	Apardal	M
-do-	-do-	Godhavi	M
-do-	-do-	Modasar	M
-do-	-do-	Sanand	M
-do-	-do-	Virapura	M
-do-	Viramgam	Aghar	M
-do-	-do-	Bhoyani	M
-do-	-do-	Dangarva	MES
-do-	-do-	Datraj	EH

District	*Taluk*	*Village/Site*	*Cultural assemblage*
Ahmadabad	Viramgam	Kamejada	M
-do-	-do-	Kanipur	Mes
-do-	-do-	Kukvav	Mes
-do-	-do-	Navagam	M
-do-	-do-	Panar	M
-do-	-do-	Shihor	M
-do-	-do-	Shobhasan	M
-do-	-do-	Viramgam	M

20. Exploration in Districts Ahmadabad, Bharuch, Junagadh, Kheda, Kutch, Mahesana, Panch Mahals, Rajkot and Vadodara.—The Department of Archaeology, Government of Gujarat, in the course of exploration located the following sites of archaeological interest.

(LPA=Lower Palaeolithic Age; MPA=Middle Palaeolithic Age; Mes=Mesolithic : H=Harappan; EH=Early Historical; RS=Rock-shelter; M=Medieval; LM=Late Medieval; and JP=Jurassic Period)

District	*Taluk*	*Village/Site*	*Cultural assemblage*	*Structural remains*
Ahmadabad	Dahegam	Amarajina-Muvada	Mes	
-do-	-do-	Anguthala	Mes	
-do-	-do-	Babra	Mes	
-do-	-do-	Baria	Mes	
-do-	-do-	Dharisana	Mes	
-do-	-do-	Ghamij	EH	
-do-	-do-	Harasoli	Mes	
-do-	-do-	Jhak	Mes, EH	
-do-	-do-	Kadadara	Mes	
-do-	-do-	Kanipur	Mes	
-do-	-do-	Kantharapur-Juna	Mes	
-do-	-do-	Karoli	EH	
-do-	-do-	Kodrali	Mes	
-do-	-do-	Lavad	EH	
-do-	-do-	Madhavgadh	EH	
-do-	-do-	Nandol	Mes	
-do-	-do-	Salki	Mes	
-do-	-do-	Vadavasa	EH	
-do-	-do-	Vasana Rathod	EH	
Bharuch	Vagra	Chanchvel	M	
-do-	-do-	Dahej	M	
-do-	-do-	Kaladra	M	
-do-	-do-	Trankal	EH	
-do-	-do-	Vilayat	M	
Junagadh	Talala	Chitrol	LM	
-do-	-do-	Sangodara	LPA	
-do-	Veraval Patan	Savani	H	

District	*Taluk*	*Village/Site*	*Cultural assambledge*	*Structural remains*
Kheda	Kapadvanj	Bhutia	MES, MPA	
-do-	Nadiyad	Vaso	—	Amin-in-Haveli
Kutch	Abdasa	Kothara	H	—
-do-	Anjar	Anjar	MES	—
-do-	-do-	Bhuvad	—	Bhuvaneswar temple
-do-	-do-	Kotda	JP	—
-do-	Bhachan	Kalyanpur	M	—
-do-	Bhuj	Bhujodi to Mundra	MPA	—
-do-	-do-	Bolari	JP, MES	—
-do-	-do-	Kera	MES	—
-do-	-do-	Khavda	H, MPA, LM	—
-do-	-do-	Madhapar	JP, MPA	—
-do-	-do-	Ninaper	LM	—
-do-	Lakhpat	Lakhpat	—	Fort, Navakuba Dargah
-do-	Mandvi	Kodai	M	—
-do-	-do-	Mandvi	—	Bhutiyo Kotho
-do-	-do-	Rajpar	—	Bilesvar
-do-	Mundra	Mundra	—	Parsvanath jinalaya, Shah Bukhari Dargah
-do-	-do-	Samghogha	M	—
-do-	Nakhantrana	Desalpur Guntali	LPA	—
-do-	-do-	Kotda	M, LM	—
-do-	-do-	Mathal	MPA	—
-do-	-do-	Roha	—	Palace, Radha-Krishna temple
-do-	Rapar	Chitrol	H	—
-do-	-do-	Ramvav	H	—
Mahesana	Vijapur	Mahudi	—	Kotyarka temple
Panch Mahals	Halol	Baska	MES	—
-do-	Shahera	Tarsang	MES, M, RS	
Rajkot	Gondal	Karmar	H	
-do-	Morvi	Hajnadi	H	—
Vadodara	Jetpur	Visadi	MES	—
-do-	Padara	Bhoj	—	Step-well
-do-	Vadodara	Angadh	MES	—
-do-	Vaghodia	Vyara	MES	

21. EXCAVATION AT ZEKHADA, DISTRICT BANAS KANTHA.—The Department of Archaeology and Ancient History, M. S. University of Baroda, conducted excavation at the habitation sites situated on the sandstone outcrop known variously as Hamasari, Harpasari or Amasari-no-Tekro, in the vicinity of Zekhada in Santalpur Taluk, with a view to investigating their cultural content.

The excavation revealed a 1.5-m thick deposit belonging to the chalcolithic culture, when the people lived in circular huts, occasionally provided with porch, built of wattle-and-daub. The floorings of the huts were made of rammed earth sometimes mixed with lacromina croix. The ceramic industry of the culture represents such forms as dish-on-stand, goblet, bowl, jar, etc., which show similarities with those from Harappan and post-Harappan sites like Rangpur, Surkotada, Ahar, etc. Other important finds from the excavation include: cores and blades of stone; beads of carnelian, jasper, lapis lazuli and faience; bangles, awl, wires of copper; and terracotta triangular and rectangular tablets and balls. These sites seem to represent rural settlements of the chalcolithic culture.

22. EXCAVATION AT KANEWAL, DISTRICT KHEDA.—With a view to investigating cultural content of the sites, Shri K. N. Momin, under the guidance of Professor R. N. Mehta of the Department of Archaeology and Ancient History, M. S. University of Baroda, carried out excavation on two mounds known as Kesrisimha-no-Tekro and Sai-no-Tekro, situated on the bank of the lake at Kanewal in Bhalbaru region of Cambay Taluk.

The excavation revealed that Kesrisimha-no-Tekro represented a single culture occupation belonging to chalcolithic period, divisible into two phases, A and B. Two circular huts built of wattle-and-daub and having rammed earth floorings were encountered at different levels. Household articles such as pots, quern, terracotta lamp and twenty-two complete terracotta balls were recovered from the huts (pl. XIV B). The ceramic industry of the Period is represented by plain and painted red, coarse red, buff, lustrous red and incised wares. The common shapes encountered are dish-on-stand, dish, bowls of different shapes, basin, storage jar, high-necked vases, etc., showing strong affinities with the ones from Lothal B, Rangpur II A, II B and II C and Period III. Other important antiquities recovered include: beads of faience, conch, carnelian; terracotta sling balls and spindlewhorls; and saddle querns and pestles of stone. Noteworthy finds, however, are a few sherds bearing incised characters of the Harappan script.

The excavation on Sai-on-Tekro mound revealed that the site was first settled by the Mesolithic people who subsequently were followed by the chalcolithic. The chalcolithic deposit is sealed by wind blown sand dunes which in turn yielded microliths and animal bones. In the chalcolithic levels two circular huts, similar to those found at the above site, were encountered. Two fragments of dish-on-stand, a dish, miniature pots, vases and a bowl in plain and painted red ware were recovered from the huts. The pottery both in form and fabric is similar to the one reported from Rangpur II B and II C.

23. EXCAVATION AT PABUMATH, DISTRICT KUTCH.—The Department of Archaeology, Government of Gujarat, carried out a small-scale excavation at Pabumath near Suvai in Rupar Taluk.

The excavation revealed a 5-m thick cultural deposit belonging to the late Harappan period. A large structure consisting of a number of rooms (size: 3.10 X 3·10 m), standing on the foundation of two courses of undressed stones, was partially exposed. A few pot-burials were encountered in the foundation of the structure. During the excavation it was found that before the site was first occupied by the late Harappans it seems to have been cleared of vegetation by burning. Noteworthy ceramics include painted black-on-red and reserve-slipped wares, painted motifs being parallel, wavy, zigzag lines, triangles, pipal leaf and peacock. Other finds include: beads of paste, carnelian, agate, chert, shell; and bangles of shell. The animal bones recovered include those of cattle, goat, sheep, boar and varieties of deer, fish and birds.

24. EXCAVATION AT TARSANG, DISTRICT PANCH MAHALS.—Shri V. H. Sonawane of the Department of Archaeology and Ancient History, M. S. University of Baroda, under the guidance of Professor R. N. Mehta, conducted excavation at Tarsang, in a painted rock

shelter in the Maheshvar hill, a granite outcrop of Champaner series, situated about 30 km north-west of Godhra. The excavation revealed (from bottom upwards) three successive layers with an overall thickness of 80 cm marked by weathered rock, compact deposition with microliths and loose brownish and ashy earth yielding finds belonging to historical times.

Excavation yielded upwards of eighty thousand stone pieces comprising nodules, waste flakes, cores, hammer-stones, anvil and microliths such as backed, obliquely blunted, notched and penknife blades, lunates with blunted chord and arc, equilateral, isoscele and scalene triangles, trapezes, trapezoids, points, borers, burins and variety of scrapers, made on quartz, chalcedony, jasper, chert and agate. Besides, bone points, dentalium shell and charred bones were also recovered. This deposit, which has not yielded any pottery, may be termed as Mesolithic.

The antiquities obtained from the topmost layer range in date from early centuries of the Christian era to the medieval times.

25. EXCAVATION AT KARVAN, DISTRICT VADODARA.—In continuation of the last year's work *(1976-77,* p. 18) the Western Circle of the Survey, under Dr C. Margabandhu, assisted by Sarvashri D. K. Naik and P. K. Trivedi, resumed excavation at Karvan with a view to understanding the settlement pattern and the cultural sequence of the ancient township in relation to the earlier exposed brick temples.

The excavation near the ancient brick-base of Sindhvai Mata Temple, situated to the north-west of the excavated temple-complex, revealed two phases of structural activities (pl. XV A).

Likewise the excavation at Phulwa Tekri and Vatavagar, representing the habitation site revealed two periods of occupation.

Period I, represented by a 75-cm thick cultural deposit, belonging to the early historical times, is marked by floorings laid in brick (size: 36 X 26 X 8 cm), brickbats and thick mud-patch mixed with *kankar* and a wall of four courses running north-south, encountered at Vatavagar. Although traces of habitation were duly recorded no identifiable structure was encountered at Phulwa Tekri. The ceramic industry of the Period is represented by red polished ware, as also black-slipped ware, with fabric similar to the former. Main shapes include sprinklers, carinated miniature vases and a few vessels with decorative motifs. Other decorations consisted of incised vertical and horizontal herring-bone patterns. Notable objects include: stone plaques showing human figures with prominent head-dress; terracotta human and animal figurines, ear ornaments, areca nut-shaped beads, wheels, discs, pendants, marbles, hopscotch, gamesmen, conical objects, etc.; shell objects such as cut columela (pl. XVI A), decorated bangles, discs; and beads of semi-precious stones like agate, carnelian, rock-crystal, garnet, jasper, quartz, etc. A dagger-shaped pendant with incised decoration of bone (pl. XVI B) and a ring of carnelian with provision for insertion of precious stone are particularly noteworthy. Period II, belonging to the medieval times, is represented by two successive floors paved with bricks and brick-bats showing eight post-holes in a row, exposed at Phulwa Tekri and a huge storage jar consisting of four rings placed one over the other, narrowing at the top (75 cm) and broader at the bottom (1.25 m) laid in a pit, and a brick-kiln (pl. XVII A) with six courses of bricks *in situ* and with provision for fuel, exposed at Vatavagar. No structure, however, was encountered, though bricks and brick-bats were recovered in plenty from the debris. The ceramic industry is represented by the typical glazed ware (pl. XVII B and C) of blue, cream and green varieties, dull-grey ware with thick section, ill-fired red ware and polished red ware with white painting around the shoulders. Also, dull grey ware and ill-fired red ware are represented by storage and cooking pots (pl. XV B). Graffiti marks were also noticed on some of the vases. Other important finds recovered from the deposit of this Period include: terracotta beads; coins; shell bangles; monochrome and polychrome bangles; and

iron objects. Noteworthy among the finds, however, is a bowl bearing an inscription on the interior inscribed in Devanagari characters of twelfth century A.D. reading *kcha-ha tarn.*

HARYANA

26. EXCAVATION AT DAULATPUR, DISTRICT KURUKSHETRA.—In continuation of the last year's work *(1976-77,* p. 19), the Department of Ancient Indian History, Culture and Archaeology of the Kurukshetra University, under the direction of Dr U. V. Singh and assisted by S. P. Shukla, resumed the excavation with the objectives of: (i) obtaining further details of the Painted Grey Ware settlement; and (ii) ascertaining the cultural sequence in other parts of the site, besides imparting field training to post-graduate students.

The excavation on the higher part of the western, southern and eastern slopes of the mound confirmed that the late Harappan and the Painted Grey Ware people had not occupied the eastern half of the mound.

Period I, belonging to late Harappan times, and represented by an average thickness of 1-80 m deposit overlying the natural soil, is characterized by the occurrence of thick red ware, painted in black with linear and geometrical designs, sometimes showing incised decoration, besides thick grey ware in small quantity. Several vases in red ware had their lower exterior surfaces roughened while a few had their interior decorated with incised designs. Among other finds of the Period, mention may be made of: terracotta animal figurines, mostly bulls, triangular and circular cakes, bangles, discs, balls, toy-cart wheels with single hub; bone points and arrowheads; beads of paste, faience, steatite, stone and terracotta; faience bangles; and a fragment of copper spearhead.

Period II, represented by an average deposit of 1.50-m thick, is characterized by the occurrence of the Painted Grey Ware, along with associated wares and a few sherds of black-slipped and black-and-red wares. Besides, three floor levels having broken pots *in situ* were encountered. Evidence of a post-hole and a corn-bin for storage purpose was also recorded. Other finds of the Period include: bone points, arrowheads, a bow-shaped objects with a hole at one end; terracotta *ghata*-shaped beads, bangles, discs, wheels with single or double hubs, grey coloured stopper-like objects; stone beads; and copper bangle and bead. It is interesting to note that the upper levels of the Period yielded two fragments of iron objects and a piece of glass bangle.

Period III, belonging to the early historical times, did not yield any structural remains. Noteworthy antiquities of the Period, however, include: terracotta animal figurines including figures of horse and camel with flat circular base, probably used as gamesmen, balls including a few polished ones, discs, a conical object with flat bottom engraved with a flower-like design, possibly a potter's stamp, wheels and dabbers; beads of glass, stone and terracotta; glass and shell bangles; a few copper coins; and miscellaneous iron objects such as fragments of blade, sickle, nail, ring and a figure of bird.

Period IV, represented by the topmost layer and a few pits, yielded knife-edged bowls, *handis* and other varieties of pots, bearing stamped and incised decoration and sometimes painted in black with simple linear designs. The antiquities of the Period include: terracotta animal figurines, beads; pottery discs; and a few iron objects. No structures were encountered in the excavated area.

JAMMU AND KASHMIR

27. EXPLORATION IN DISTRICT ANANTNAG.—Shri Sardari Lai Shali of the North-western Circle of the Survey, in the course of exploration discovered near Takiya Bala, 33 km from Srinagar, an ancient site, datable to the Kushana period. The site is situated on levelled terraces.

The surface finds include sherds of red, black-slipped and grey wares and terracotta tiles bearing petal motifs which are similar to the ones from Harwan. Besides, an inscription in Brahmi characters of the fourth century A.D., engraved on a huge block of rock lying on the right bank of the Chandrahara was also noticed.

28. EXCAVATION AT SEMATHAN, DISTRICT ANANTNAG.—Shri H. K. Narain of the North western Circle of the Survey, assisted by Sarvashri Sardari Lai Shali and R. D. Singh, conducted an exploratory excavation at Semathan (ancient Chakrdara-Tsakdar) near Bijbihara (ancient Vijbror), 48 km from Srinagar. During the excavation it was found that the topmost layer of 50 cm thickness was disturbed. Underlying this deposit was a mud floor with white *karewa* patches. The floor yielded medium to thin red ware of the early historical period, represented by bowls, vases and dishes. This deposit in turn seals a brick pavement of single course, laid in mud mixed with husk. A stone drain was noticed below the brick pavement, which might have been used for bringing water from a nearby spring, traces of which were also recorded. Impor tant finds collected during the surface exploration include: terracotta human and animal figurines such as bust of a male, monkey, bull and horse; and copper nail with a knob-head.

29. EXPLORATION IN DISTRICTS JAMMU AND RAJAURI.—Shri R. D. Singh of the North western Circle of the Survey, during the course of his exploration of the Imperial Mughal route from Kalal to Rajauri noticed remains of *sarai,* mosques, fort and *baolies,* etc., belonging to the Mughal times at Chingas, Nadpur, Naoshera and Rajauri. A fort-complex with a shrine dedicated to Mangla Devi was also noticed near village Seri in District Rajauri, at a distance of 125 km from Jammu. This fort is reported to have built by Maharaja Gulab Singh, founder of Jammu and Kashmir State and the first ruler of the Dogra dynasty.

30. EXPLORATION IN DISTRICT SRINAGAR.—Sarvashri S. L. Shali and R. D. Singh of the North-western Circle of the Survey, in the course of exploration in the District, noticed sculptures of Vishnu and other deities at Arigom and Raithan both in Badgam Taluk.

31. EXPLORATION IN DISTRICT UDHAMPUR.—Shri H. K. Narain of the North-western Circle of the Survey, along with Sarvashri S. L. Shali, Puran Singh, Mohinder Kumar Batra, in the course of exploration in the District located an ancient site at Ghora Gali, 2 km north east of Gul, and noticed a number of late medieval sculptures and a mound cut through for laying a road. The surface collection include sherds of medium to thick red ware represented by lids, bowls, basins, etc.

KARNATAKA

32. EXCAVATION AT VADAGAON-MADHAVAPUR, DISTRICT BELGAUM.—In continuation of the last year's work *(1976-77,* pp. 21-24), the Department of Ancient Indian History and Epigraphy and the Kannada Research Institute, Karnatak University, Dharwar, under the direction of Dr A. Sundara, resumed excavation with the following objectives: (i) to ascertain the extension of the rammed flooring; and (ii) to expose the structures fully, which were encountered in Site 3 in the earlier excavation.

The excavation revealed that the rammed flooring encountered earlier was in fact a part of a street which was exposed to a length of more than 100 m and was found to have an average width of 7 m and a stratigraphic succession of seven phases. Of which the lower three may be assignable to the first half of the first century A.D., and the upper four to the late Satavahana times, datable from the latter half of the first century to the beginning of the third .

Further excavation of the structure, exposed earlier, revealed that it consisted originally of two adjacent squarish rooms and an oblong narrow hall on the eastern side but was later enlarged on the east by providing another room of the same length as that of the hall. A lime plastered squarish low platform was encountered in the centre of this room. Subsequently, one more room seems to have been added on the southern side. Another structural complex consisting of a room and a hall was exposed on the same site. On the northern side of the street was found a baked brick circular granary and a square well which had a brick lining up to the laterite bed-rock beyond which it was circular, cut into the bed-rock.

The ceramic industry of the Period represented on Site 3 includes black-and-red, polished red and coarse red wares. Other finds include: beads of semiprecious stones, shell, glass; ivory dices; copper coins with Ujjain symbol; terracotta dice, coin moulds and fragments of human figurines; Satavahana potin coins; and Kshatrapa coins. Noteworthy mention may, however, be made of a finely modelled terracotta hollow human head with protruberance on the top of the head, probably representing the Buddha in western Deccan style and a fragment of globular pot, having moulded relief on the exterior, showing probably a seated two-handed Ganesa.

33. EXPLORATION IN DISTRICT BELLARY.—Shri K. Venkateswara Rao of the Mid-southern Circle of the Survey, during the course of his exploration, noticed an early historical site on the south-western foot of the Bommappana Gudda, half a kilometre north of Hirekal village in Siruguppa Taluk, yielding black-and-red, red-slipped, black polished and dull-red wares, some of the sherds of black polished ware showing graffiti marks.

He also collected a few fluted cores in jasper and polished stone axes, made on basaltic dyke, from the foot-hill of Sukradappana-gudda at Nittur. Besides, a number of megalithic burials, represented by cairn-circles and pit-circles, were noticed in the vicinity of the recently-discovered Asokan edict.

34. EXPLORATION IN DISTRICTS BELLARY, CHITRADURGA AND RAICHUR.—In the course of exploration, Dr A. Sundara of the Department of Ancient Indian History and Epigraphy, Karnatak University, noticed rock-paintings, two at Kurugodu (District Bellary), four each at Anegondi and Chik-Rampura, one each at Harlapura, Mallapura and Narayanpeth (all in Gangavati Taluk in District Raichur) and Manvi (District Raichur). The rock-paintings in all the places except Manvi, represent human figures in group or single and animal figures such as tiger, cattle, deer and peacock in red ochre. Among the paintings so far noticed, a standing human figure of 4 m height, body decorated with geometrical designs, is the tallest one. A scene depicting a woman seated with knees raised and hairs dishevelled on both sides with a group of dancers and animals is interesting. A human figure at Anegondi has a tail. In Manvi, the paintings in ochre on yellow *chunam* base are narrative panels of historical importance of the Vijayanagara period. Other paintings mentioned above probably belong to an overlap phase between neolithic and the Iron Age periods as well as later period.

Besides, rock-engravings, depicting cattle, bison and elephant, were noticed at Chitradurga, Brahmagiri and Jettinga Rameshvara (all in District Chitradurga) and at Kurugodu (District Raichur).

Further, in the vicinity of some of these paintings and engravings, neolithic habitation sites at Anegondi and Harlapur, neolithic-cum-megalithic habitation sites at Chitradurga, Jettinga Rameshvara and megalithic site at Mallapura were noticed. Besides, pits with neolithic remains and an early historical site were noticed at Halasabalu near Harihara, on the bank of the river Tungabhadra. Among the sculptures noticed by him, a fine sculpture of Madhava in *samabhanga* belonging to Rashtrakuta times, at Hale Dyamavvanahalli, a *naga* sculpture with *tirthankara* image above the hoods, at Bilichodu (all in District Chitradurga) are noteworthy.

35. EXPLORATION IN DISTRICT BIDAR.—Shri R. M. Shadakshariah, Research student in the Department of Ancient Indian History and Epigraphy, Karnatak University, in the course of his epigraphical survey, noticed the following ancient sites.

(MPA = MIDDLE PALAEOLITHIC AGE; NEO = NEOLITHIC PERIOD; MEG = MEGALITHS; AND EH = EARLY HISTORICAL)

District	*Taluk*	*Village/Site*	*Cultural assemblage*
Bidar	Bhalki	Bhalki	EH
-do-	-do-	Bhatmbra	EH
-do-	-do-	Chitta	EH
-do-	-do-	Gorchincholli	NEO
-do-	-do-	Lanjawada	EH
-do-	-do-	Nagoor	NEO
-do-	-do-	Yannukura	MEG, EH
-do-	Bidar	Bagadal	EH
-do-	-do-	Honnaddi	MEG
-do-	-do-	Sangolgi	EH
-do-	-do-	Sirsi	MEG
-do-	-do-	Srikanthanagalli	MPA
-do-	-do-	Sultanpur	MEG

36. EXPLORATION IN DISTRICT BIJAPUR.—With a view to ascertaining the geological context of the Acheulian tools, Shri R. Korisettar and Dr S. N. Rajaguru of the Deccan College Post-graduate and Research Institute, Pune, carried out detailed geomorphic study of the hill slopes at Almatti on the Krishna, where Acheulian tools were noticed earlier by Dr H. D. Sankalia and Shri S. S. Malavad.

The geological setting of the area is represented by pre-Cambrian Kaladgi sandstone and quartzites. The main stream Krishna and the tributary nullah have dissected into this formation. Around this locality, the Krishna flows in a broad shallow valley flanked by Kaladgi hills. The occurrence of gravels at about 6 to 8 m above the present bed of the Krishna, and the absence of evidence of buried channels in the area (Almatti Dam-site) suggest an upward fluctuation of the river in the past. This has been further supported by the occurrence of valley-floor deposits (high level gravels) at about 5 to 15 m above the present bed in the entire middle Krishna. Around Almatti, these gravels occur in association with local hill-wash debris. This alluvio-colluvial gravel overlies the lateritized basal Kaladgi rock.

The tool-scatter is mainly on the sub-recent surface of the nullah on the left bank surface. A couple of trial pits along the slopes exposed mainly colluvial rubble. This indicates that the tools do not belong to any distinct geological horizon. Yet it is logical to infer that the tools formed part of slope material and were washed down the slopes as creep wash. The proximity of raw material and other natural resources provided a temporary shelter as revealed by fresh condition of the tools.

The geomorphic features like ancient pediplain surface over which the Krishna has carved its shallow saucer-shaped valley, the incipient lateritization of pediplained surface and subsequent channel deposition and calcretization of surfacial sediments in the area indicate

considerable changes in the environment during the Quaternary. In the absence of precise radiometric dates, the various events can be hypothesized as follows.

1. Laterites — Sub-humid climate (150 per cent increase in rainfall): early Quaternary
2. Bouldery channel gravels and calcretes — Semi-arid climate: mid Quaternary (synchronous with Acheulian Man)

37. EXPLORATION IN DISTRICT CHITRADURGA.—Shri K. Venkateswara Rao of the Mid-southern Circle of the Survey, during the course of exploration, noticed megalithic burials of cairn-circle type at Jampanna Nayakana Kote.

Sarvashri G. C. Chauley and K. Venkateswara Rao of the Survey located a number of rock-shelters in Barlagondi hill at Chandravalli. A few ground stone axes in different stages of manufacture, stone balls and a human skull, found buried in association with an axe, and potsherds of the neolithic times, were recovered from the shelters.

Sarvashri B. Raja Rao and K. Venkateswara Rao of the Survey noticed a megalithic cist burial bound by cairn-circle at Neralagondi. Further, a rock-bruising was discovered on a huge granite boulder on the right bank of a stream at Barlagondi. The rock-bruising depicts a man with weapons (bow and arrow?) in his hands followed by a dog and a female child. An antelope facing the man is carved in front of him.

38. EXCAVATION AT CHANDRAVALLI, DISTRICT CHITRADURGA.—Shri V. Mishra of the Mid-southern Circle of the Survey, assisted by Shri K. Venkateswara Rao, conducted excava tion at Chandravalli, which had been excavated earlier by Dr M. H. Krishna and Sir Mortimer Wheeler. The objectives of the present dig were: (i) to excavate a good portion of the site before its submergence under the proposed Irrigation Dam to establish the relationship between the rock-shelters and the neolithic folk; and (ii) to revealing some more historical evidences of the Satavahana period (fig. 5).

Period I, belonging to the neolithic culture, is represented by remains of huts with circular flooring and post-holes at regular intervals. The ceramic industry of the Period consists of hand-made burnished grey ware with coarse core. Number of ground stone axes with lenticular section and sharp cutting edge were recovered from the deposit. Microliths are conspicuous by their absence.

Period II, belonging to the megalithic culture, is marked by the occurrence of Black-and-red Ware and occasionally black polished ware. Graffito mark was noticed on a small vase of red ware. The commonest shape met with in the ceramic industry of the Period is a straight-sided bowl with sharpened and slightly everted rim and a flat base. An interesting evidence is the occurrence of mass burials of animals in which sherds of Black-and-red Ware were found.

A disturbed cist-burial with cairn packing and a stone-circle was also excavated. It yielded sherds of Black-and-red Ware, Russet-coated Painted Ware, few Satavahana coins and pear-shaped terracotta beads but no skeletal remains. This Period was found to overlap with the succeeding Period.

Period III, belonging to the early historical times, is represented by a huge structure (4.20 X 2.50 m) consisting of many rooms and a number of floors. The ceramic industry is represented principally by the Russet-coated Painted Ware. The designs include criss-cross or trellis, radiating lines terminating in pellets, dotted lines, lines with frond-like branches and occasionally hatched triangles. Of these, some sherds show lines of notched or herring bone pattern or applique bands with finger-tip pattern on them. A fine reddish buff ware, externally slipped with bright red slip, is also represented. A jar comparable to amphora in red ware was also found in this level. Important antiquities recovered from this Period include: twenty-five

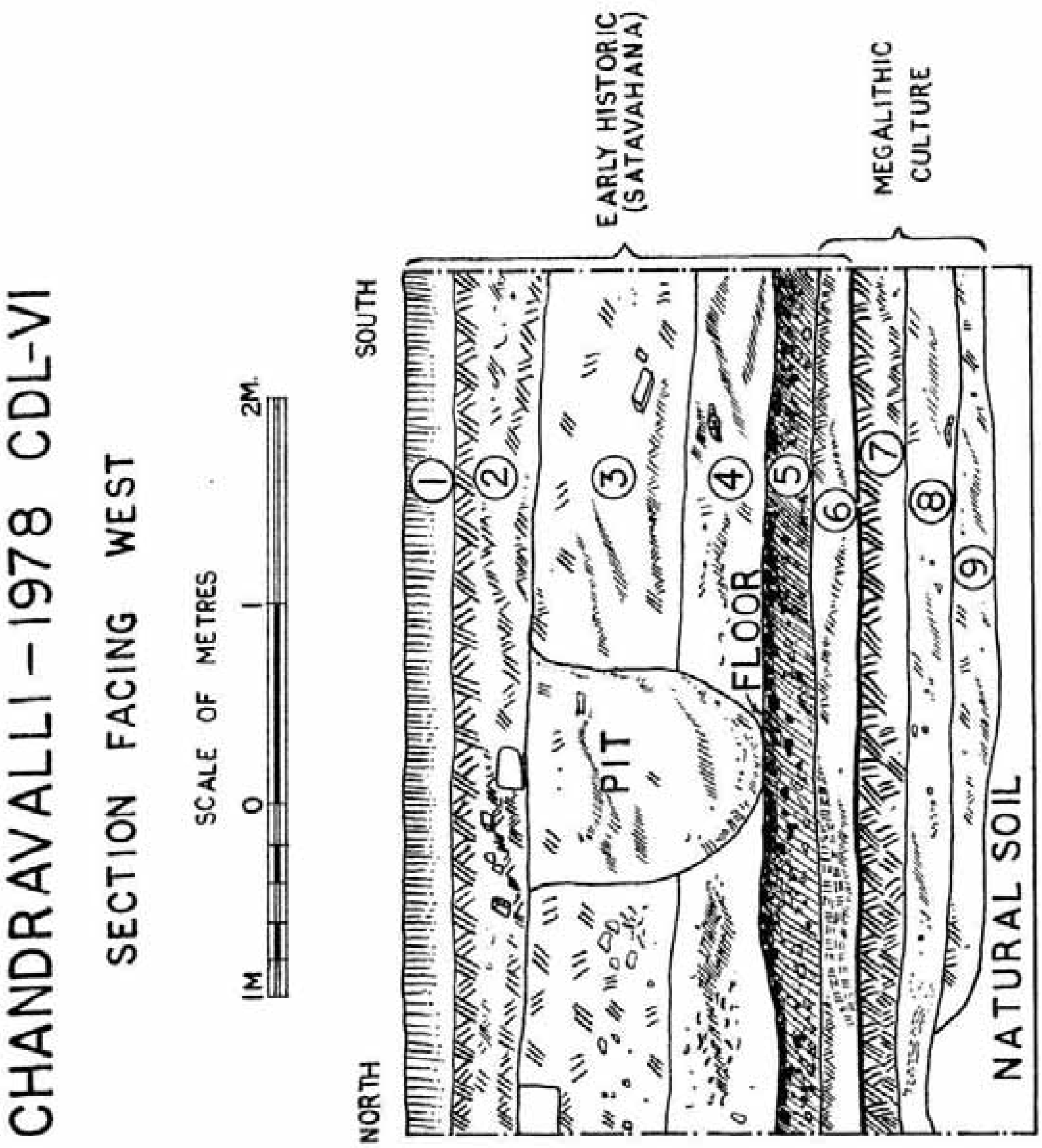

CHANDRAVALLI - 1978 CDL-VI
SECTION FACING WEST
SCALE OF METRES
1M
0
1
2M.
NORTH
SOUTH
EARLY HISTORIC
(SATAVAHANA)
MEGALITHIC
CULTURE
1
2
3
4
5
6
7
8
9
PIT
FLOOR
NATURAL SOIL

FIG. 5

lead, four potin and thirty-nine copper coins, of which most of the potin coins have humped bull on the obverse with a Brahmi legend and a crescent on a hill and a tree with railing on the reverse, and with minor variations, ascribable to the Satavahanas, Anandas and Maharathis, besides a new type of lead coin with a Brahmi legend, *Sasarajana Kalahana* probably belonging to Maharathis; beads of agate, carnelian, rock-crystal, glass, jasper, shell, terracotta, faience, paste, lapis lazuli; copper and terracotta ear and nose ornaments; terracotta human and animal figurines, such as *vamanaka,* mother goddess, *nagas,* standing nude male; and ivory dice, bangles, needle-shaped rod. Coins of Muslim and Mysore Wadeyars, a miniature soapstone sculpture depicting three female *(sakti)* goddesses seated in *virasana* posture with a long sword in their hands, probably belonging to late medieval period, were recovered from the disturbed layers. The excavation in one of the two rock-shelters yielded a human skeleton in a sitting posture. The date of the skeleton is, however, doubtful as the pit yielded neolithic as well as modern finds like polished stone axes and a miniature *Siva-linga* on *yoni*-pedestal of soapstone.

39. EXCAVATION AT HUNSGI, DISTRICT GULBARGA.—In continuation of the last year's work *(1976-77,* pp. 25-26), Dr K. Paddayya of the Deccan College Post-graduate and Research Institute, Pune, conducted excavation at a new Acheulian locality (Locality VI), 1.0 km northeast of the village Hunsgi and 75 m from the left bank of the Hunsgi nullah, measuring 100 m east-west and 40 m north-south, with a view to ascertaining the stratigraphical context of fresh Acheulian tools and debitage of limestone occurring on surface along with medieval pottery and animal bones. The following stratigraphy was observed in the excavation.

Layer 1	... 20 cm in thickness; loose, greyish black soil very much disturbed due to ploughing and yielding medieval pottery and animal bones, and Mesolithic artefacts of whitish chert along with a few Acheulian artefacts.
Layer 2	... 10 cm in thickness; loose granite gruss mixed up with black soil; cultural material same as that of layer 1, but pottery and animal bones, and Mesolithic artefacts were found in smaller numbers.
Layer 3	... 20 cm in thickness; compact, whitish/brownish gruss yielding Acheulian tools and debitage of limestone (Acheulian horizon 1); potsherds and Mesolithic artefacts very rare.
Layer 4	... 25 to 30 cm in thickness; hard, whitish/brownish gruss with Acheulian tools and debitage (Acheulian horizon 2); pottery and Mesolithic artefacts absent.
Layer 5	... Sterile gruss.

From the occurrence of potsherds, etc., it is evident that Acheulian Horizon 1 has suffered disturbance due to ploughing and other agricultural activities. These objects obviously got infiltrated from the overlying levels. As against this, Acheulian Horizon 2 represents a true occupation level. It yielded about fifty large artefacts (handaxes, cleavers, etc.) and over eight hundred chips and flakes in association with nodules of limestone and other rocks, transported to the site by man for use as raw material.

An interesting feature of Horizon 2 is that seven large granite blocks (50 cm to 2 m across and forming part of the bed-rock) were found in a row in northwest-southeast direction; these were found 40 to 50 cm above the occupation level. It is important to note that the majority of artefacts were found to the west of this alignment. In this connection it should be mentioned that 5 to 6 m to the west of the trench a cluster of granite boulders was observed on surface earlier; unfortunately, these have now been blasted away and removed to the edges of the field. If these blocks are considered in relation to those found in excavation, it would seem that, as at Locality

V, the Acheulian inhabitants selected for their camping activities a naturally formed open area enclosed by granite boulders.

With regard to the medieval pottery, its context is not clear. The absence of any structural remains in any part of the locality and the reported finding of pot-burials in the course of ploughing probably suggest that the site served as a burial ground during this period. Although no regular horizon is observable, the occurrence of Mesolithic artefacts indicates that the site was also occupied by the Mesolithic folk.

40. EXPLORATION AND EXCAVATION IN DISTRICT RAICHUR.—Sarvashri P. B. S. Sengar, A. J. Nambhiraju, Basheer Khan and H. K. Manik of the Prehistory Branch of the Survey, carried out exploration in the District and collected neolithic implements along with microliths from the cultivated fields in the vicinity of Betudur, Kakargal and Ramdrug. They discovered Mesolithic and neolithic sites at Mallapur and Rampur. Besides, microliths were recovered from the stratified deposit of red soil and neolithic implements from the surface.

Further, three neolithic ash-mounds were located in the vicinity of Gorkal in Manvi Taluk. The largest mound (200 X 150 m), situated on the slope along the foot of the hill, lies 1 km south of Gorkal. The surface collection includes ground stone axes, long and short blades of chert, sling stones of various sizes, grinding stones and sherds of burnished grey and black wares. The other two mounds, now under seasonal cultivation, comparatively smaller and flattish, also yielded neolithic implements, pottery and microliths.

A small-scale excavation, conducted at the largest mound, revealed a 1.40-m thick deposit, comprising four layers, all belonging to the neolithic culture. Layer 1, of 20-cm thickness and largely disturbed, is composed of very loose blackish ash mixed with humus and pieces of stone. Layer 2, of 45-cm thickness, is distinguishable by its compact brownish ash, mixed with slags. Layer 4, of 35-cm thickness, is made of dark black ash at the top and mixed sand at the bottom. Three urn-burials, kept in pits, cut into layers 2 and 3, were encountered. The urns are of coarse grey ware, indifferently baked, being pear-shaped, with wide mouth and out-turned featureless rim and rounded base. The skeletal remains consisted of skull, rib-bones and a few long bones, all of infants. The urns were covered with bowls, invertedly placed. Pottery recovered from the excavation includes handmade burnished grey, black, cream wares and plain handmade grey, red and buff wares. Some of the sherds also show decoration on them. Other finds include: polished stone axes, grinding stones, sling balls, blades including long ones; and a large quantity of charred and uncharred animal bones, indicating that the ash-mound was made up of deliberate deposition.

KERALA

41. EXPLORATION IN DISTRICTS ERNAKULAM, IDIKKI AND KOZHIKODE.—In the course of his exploration, Shri M. Raman Namboodri of the Southern Circle of the Survey noticed menhirs at Karnan Muzhi and Mulanthuruthy and dolmens at Chakkimedu, Idamalayar colony, Koorkuzhi, and Thudathur, on the eastern bank of the river Idamalayar. Dolmens at Thudathur are multi-chambered. Ruins of a Siva temple were noticed at Thundathil on the northern bank of the river Periyar. Further, he also noticed a multi-chambered rock-cut cave of megalithic period, yielding sixteen four-legged jars, some with pieces of bone and an iron sword, at Thondannur and rock-cut caves at Kodassery and *topikals* at Velur, in District Kozhikode.

MADHYA PRADESH

42. EXCAVATION AT MALHAR, DISTRICT BILASPUR.—In continuation of the previous

season's work *(1975-76,* p. 23), Dr S. K. Pandey of the Department of Ancient Indian History," Culture and Archaeology, University of Sagar, resumed excavation at Malhar.

Excavation in Trench 7 revealed three phases of structural activity, belonging to the Gupta and later times, below a 1-m thick dumped deposit of black cotton soil yielding only a lew potsherds and iron nails. The first structure consisted of small rooms with plinths of slate stones. The second structure with fairly large rooms and a courtyard on the eastern side, running north-south, has the plinth of dressed massive limestone blocks, over which the superstructure of baked bricks was standing. Below these structures were encountered three successive floor levels, made of rammed earth and potsherds, the earliest one resting over the burnt layer. A thick wall of massive round boulders was found in the lowest level of the trench.

The excavation in Trench 8 revealed two phases of structural activities belonging to the Satavahana and earlier times, and it was observed that the area was abandoned after the Satavahana occupation. A massive stone wall enclosing the plinths of a house-complex, probably belonging to the Satavahana period was exposed. Below this structure were encountered walls of another structure, built of slate stone, and a circular well-shaped structure with a huge slab nearby, probably used as bathroom. A huge pit, filled up with pottery including complete bowls, was found below the structure. Antiquities obtained from the excavation include: beads of terracotta, glass, semiprecious stones; and iron nails, arrowheads and spearhead.

43. EXPLORATION IN DISTRICTS BILASPUR AND RAIPUR.—Professor R. V. Joshi, Dr G. L. Badam and Shri Rakesh Prakash Pandey, of the Deccan College Post-graduate and Research Institute, Pune, surveyed the as yet prehistorically unknown Upper Mahanadi river valley from Mahud to Seorinarayan. During the exploration, a Lower Palaeolithic site was located at Bhilai, yielding choppers (both unifacial and bifacial), flakes, scrapers and cores, made on dolerite rock. Interestingly no handaxes or cleavers were found in the entire upper reaches of the Mahanadi. Several Mesolithic sites were discovered, of which mention should be made of Batrel, Bhilai, Girod and Hataud which yielded quantities of finished tools and the debris. These tools are made of chert, jasper, chalcedony and crystalline quartz and occur usually on the rock-surfaces, and rarely within the alluvial deposits.

The river Seonath, a major tributary of the Mahanadi in this area, yielded very rich Middle Palaeolithic industries at Nandghat, Simga, Somnath, etc., several of them found in stratified context. Very fine sections ol alluvial deposits were seen in cuttings at Nandghat, exposed during the construction of the bridge across the Seonath. The sediments composed mainly of clays and fine sands occur in remarkably undisturbed bands. The entire section measured nearly 14 m, with the basal gravel containing Middle Palaeolithic tools. This is important for it yielded for the first time fossils including teeth and limb bones of *Equus, Bos* and *Cervus,* all belonging to the Upper Pleistocene period.

An Upper Palaeolithic site was also discovered on the left bank of the Seonath near Amlidih, which yielded cores, flakes, blades, burins, borers, scrapers and knives, made on chert, jasper and chalcedony (fig. *b).*

A few Mesolithic sites were discovered on the left bank of the Seonath near Amlidih, which yielded cores, flakes, blades, burins, borers, scrapers and knives, made on chert, jasper and chalcedony.

A few Mesolithic sites were discovered within the bouldery outcrops of granites along the river Hasdo, a northern tributary of the Mahanadi near Birtere and Katghora. During the drilling operations near Seoni, the alluvium in the Mahanadi valley here was found to be 25-m thick which throws considerable light on the Quaternary geomorphology of the Mahanadi basin.

44. EXPLORATION IN DISTRICT EAST NIMAR.—In the course of exploration, Shri Krishna Pal Singh Bhadoria of the Central Circle of the Survey, discovered the following ancient sites.

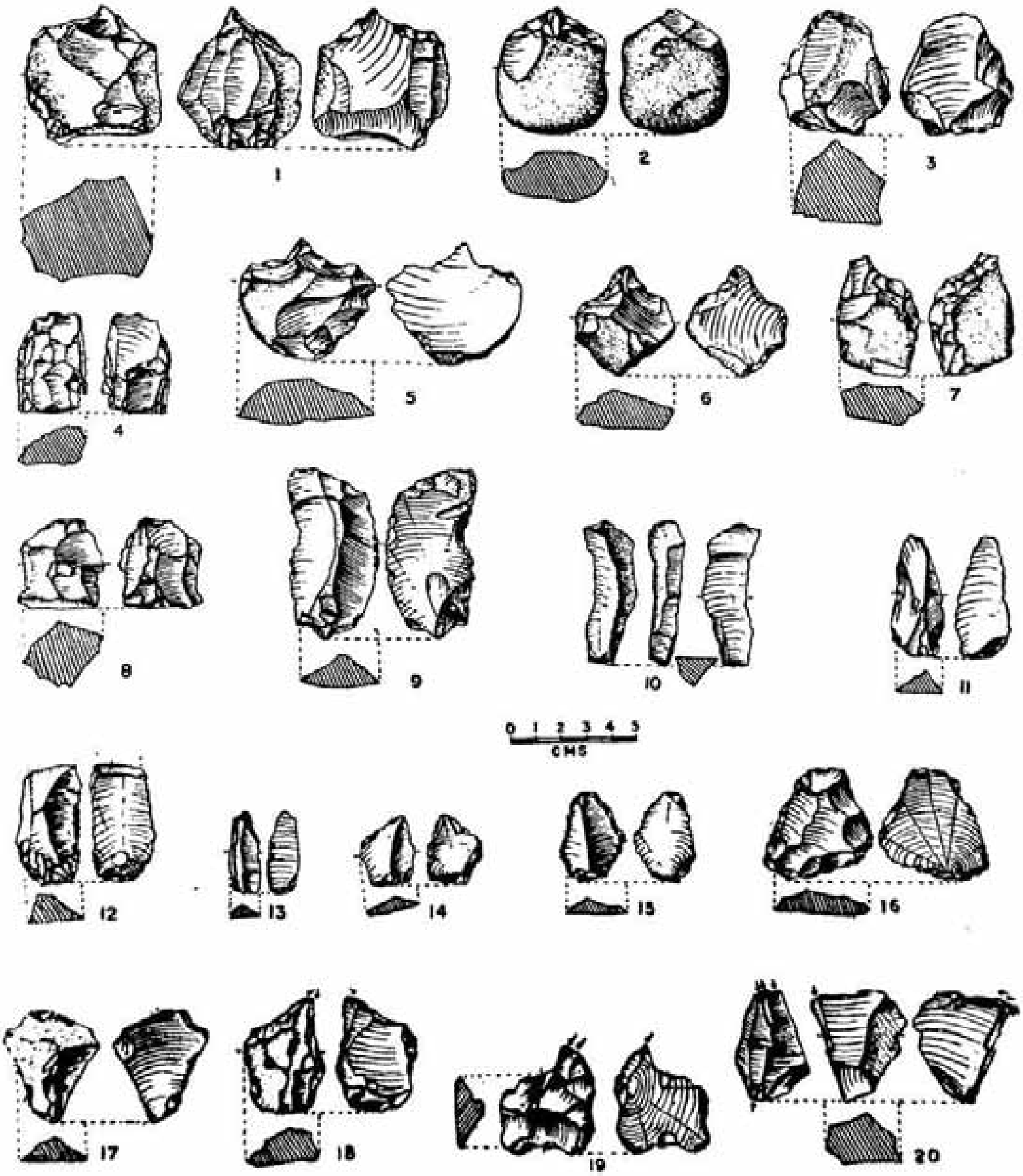


FIG. 6. *Amlidih: Upper Palaeolithic tools*

(EH=EARLY HISTORICAL ; BS=BRAHMANICAL SCULPTURES ; MC=MEDIEVAL COINS ; INS=INSCRIPTIONS ; BAO=BAOLIS ; AND F=FORT)

District	*Village/Site*	*Cultural assemblage*
East Nimar	Banki	EH, BS, MC
-do--do-	Baroli	BS
-do--do-	Dahi Nala	BAO
-do--do-	Dhulkot	EH, BAO
-do--do-	Harda	BS
-do-	Hasanpura	BAO
	Itariya	BS, BAO
	Khatla	EH, INS, F
	Piprana	BS, MC
	Sukta Khurd	BS

45. EXPLORATION IN DISTRICT INDORE.—In the course of exploration, Shri Narayan Vyas of the Central Circle of the Survey discovered the following sites.

(MES=MESOLITHIC; EH=EARLY HISTORICAL; BS=BRAHMANICAL SCULPTURES; BAO =BAOLIS; AND SS = S ATI-STONE)

District	*Village/Site*	*Cultural assemblage*
Indor	Alwasa	MES
e	Baloda	BS
-do--d	Barodia	BS
o--do-	Bhadakheri	MES, EH, BS
-do--d	Jakia	BS, BAO
o--do-	Jamodi	MES, BS
-do--d	Kadwali	MES, EH, BS
o--do-	Khamod	MES, EH, BS
-do--d	Kharuakheri	BS
o--do-	Machhukheri	MES, BS
-do--d	Manglia	BS, BAO
o-	Pirkararia	BS
	Sipra	EH
	Solsanda	BS, SS
	Todi	BS, BAO

46. EXPLORATION IN DISTRICT NARSINGHPUR.—In the course of exploration, Dr G. L. Badam of the Deccan College Post-graduate and Research Institute, Pune, made a valuable collection of vertebrate fossils from various sections in and around Devakachar, the area formed

by the Sher, timer and Varu-rewa river valleys, Barman-ghat, Kerpani, etc. A number of Stone Age tools including handaxes, choppers, scrapers, borers, etc., mostly made on quartzite were also collected from the stratigraphic levels which yielded the fossils. The fossils include: *Crocodylus palaeindicus; Gavialis* sp.; *Trionyx* sp.; *Hexaprotodon palaeindicus; Bos namadicus; Bubalus* sp.; *Stegodon insignis ganesa; Elephas Hysudricus.* Various skeletal elements were collected from the pinkish sandy horizon in several sections.

Some fossils definitelv represented the forerunners of the now living animals. They have preserved some primitive characters in dentition and other osteological parts, and appear to be less advanced from evolutionary point of view than the counterparts of present-day forms.

The tool assemblage of the fauna recovered indicates a Late Pleistocene Age for the beds, yielding the fossils. Consequently the tools found in association with the fossils belong to the same geological period.

47. EXPLORATION IN DISTRICT RAIGARH.—During the course of exploration, Shri B. K. Sinha of the Central Circle of the Survey, collected microliths at Aongra Pahar and Dharamjayagarh. Further, he noticed medieval sculptures at Kurra Pahar and Natnagar and painted rock-shelters in the vicinity of Aongra Pahar and Chandrani Pahar.

48. EXPLORATION IN DISTRICT SURGUJA.—In the course of his exploration, Shri B. K. Sinha of the Central Circle of the Survey, collected microliths at Jajgaon and from the area surrounding Ramgarh hill. Medieval remains, temple and loose sculptures were noticed at Dipadih, Ghogra, Harratoli, Maharajpur. Besides, four medieval sculptures were noticed kept in Police Station at Shankargarh. Rock-cut caves of late Gupta period were discovered by him, at Harchoka and Sitamarhi and two hoards of copper coins at Harchoka and Kudeli.

MAHARASHTRA

49. EXCAVATION AT DAIMABAD, DISTRICT AHMEDNAGAR.—In continuation of the last year's work *(1976-77,* pp. 34-38), Shri S. A. Sali of the South-western Circle of the Survey, under the guidance of Shri M. N. Deshpande, and assisted by Sarvashri G. K. Mane, D. R. Patil, D. M. Kulkarni, G. L. Gaikwad, R. S. Trambake and R. D. Ingle, resumed excavation with a view to exposing the house-plans of Phases I and II. The students of the University of Calcutta participated as trainees.

Phase I, belonging to the Savalda Culture, is represented by two structural phases. The structures were built of mud-walls of either whitish hard earth or yellowish or brownish silty earth. The houses had walls on three sides, the fourth being open, which perhaps served as an entrance to be closed with a wattle frame. Each house consisted of either single or double or three rooms. In the latter categorv of house, each room had a hearth, ovaloid or circular. Occasionally, within the room itself a separate chamber was added by providing an L-shaped wall. The smallest house or hut measured 3-40x1-60 m, whereas the largest measured 7-0 x 5-0 m. The latter had three hearths inside and four in the courtyard. The flooring of the courtyard was also mud-plastered. Each of the bigger houses vielded a muller and a quern. The houses did not show any planning, being found either adjoining each other or separated by a narrow lane, varying in width from 30 to 70 cm. The floors in the houses were made of alternate layers of rammed black clay and yellow silt. Occasionally, sub-angular pebbles were also added in the flooring material. The floors seem to have been periodically repaired and plastered with fine mud and decorated with fresh water shells, obtained from the river bed.

The present excavation confirmed the chalcolithic content of the Savalda Culture by the finds of two copper bangles. Other finds encountered include: microliths, including finely-retouched blades and corresponding cores of chalcedony; beads of carnelian and agate; phallus

shaped pendant of agate; stone mullers and querns; fresh water shells; and a ovaloid pottery object perhaps a potter's tool or a sharpener.

A preliminary study conducted by Shri M. D. Kajale of the Deccan College Post-graduate and Research Institute, Pune, of the charred grains, recovered from the occupational deposit of this Phase by using Floatation Technique, showed that the people of Savalda culture cultivated wheat, barley, lentil, common pea, grass pea, black gram/green gram, horse gram and hyacinth bean. They also consumed *her* (Indian jujube). The seeds of *her* were found in all the levels suggesting that this fruit was popular among the chalcolithic people as at present. The evidence obtained suggests that the earliest settlers at Daimabad were a well-settled agricultural community.

Phase II belonging to the late Harappan times is marked by the structural remains represented by mud-brick pieces and fragmentary mud-walls of black earth. A 30-50-cm thick wall running north-south was exposed to a length of 33 m, being found disturbed at several places by large pits. A wall running north-west from the northern end of the above wall and another disturbed wall running towards east were also traced which formed perhaps a house. With the help of these fragmentary walls as also the traces of walls and floors, a total of six structures, numbered Houses 16 to 21, were demarcated in the excavated area. None of these, however, showed a complete plan. Large patches of finely-plastered floors were exposed in the area of Houses 16-18 and 20, while a circular hearth containing charred animal bones was exposed in House 16. Base portion of a storage jar was found in the flooring of House 17. Noteworthy finds, however, were a button-shaped terracotta seal bearing an Indus sign found on the patch of a floor in House 16; a terracotta scale with a division of 11 mm marked by two incised lines on one of its sides found from House 18; and a carrot-shaped terracotta cone found in House 20.

The find of two button-shaped terracotta seals and three potsherds bearing Indus signs or letters have confirmed the Harappan character of Phase II. The Indus sign on one of the potsherds was painted in black on its exterior while on the remaining it was incised. Other antiquities recovered from this Phase include: blades and cores of chalcedony and agate; stone balls, mullers; beads of carnelian and sea shell; bone points; and a terracotta figurine representing bull.

Phase III, belonging to buff and cream ware culture, yielded interesting evidence of burials, of which one seems to be a symbolic one. Burial 1 consisted of five pots placed in an oblong pit. One of the pots, which was placed on top and lying with its mouth towards south, was of unpainted buff and cream ware. A star-shaped graffito mark was found on this pot. A carinated vase of burnished grey ware with out-curved rim, kept by the side of the above pot at a lower level also had a star-shaped graffito mark. A few bones were found placed by the side of this pot. At a still lower level but to the north of the two pots were found three black burnished ware carinated *handi* type of pots with funnel-shaped mouth also bearing star-shaped graffito marks. All these pots had lids.

Another burial consisted of six pots, of which one was painted with two horizontal rows of cross-hatched diamonds and horizontal bands on the shoulder, while the remaining five were of burnished grey ware. All these pots were found to have been kept in a circular pit partly cut into the black cotton soil. No bones were found in association with these pots, and as such seems to have been a symbolic burial. The burial pit was, however, found to have been disturbed by a later pit.

Among the other finds, mention may be made of two rim fragments of pots, which bore engraved graduations both on the upper and lower sides of the exterior. The lines marking the incisions lie at two levels on one of the specimens: on the upper side one division measures 15 mm and the other 9 mm whereas on the lower side one division measures 15 mm and the other 12 mm. On the second specimen the divisions marked measure

9 mm. The way the bigger and the smaller divisions have been made suggests that both the objects perhaps were meant for measuring purposes. Other important objects recovered include: a thin piece of copper; a fragment of a mother goddess in applique on a potsherd; blades and cores of chalcedony; beads; bone points, notched arrowhead; and stone balls, mullers and querns.

Phase IV, belonging to the Malwa Culture, is represented by either square or rectangular houses marked by post-holes. In House 9 were encountered two hearths by the side of which were placed two pots of Malwa Ware, one *kunda-type* pot of burnished grey ware and a base part of a large jar of thick coarse ware. A thin almond-shaped copper object, perhaps a mirror was found close to one of the hearths. In another house, around an unbaked clay *kunda,* a dozen flat, ovaloid and barrel-shaped stone mullers were found.

The most interesting evidence found in the deposits of this Culture related to twelve burials within the habitation. These can be classified into five types: (i) double-urn burial, the burial urns of burnished grey ware with splayed out mouth being placed mouth-to-mouth horizontally in the north-south orientation; (ii) single-urn burial with a conical bowl placed in the mouth, both being placed horizontally in the north-south orientation; (iii) treble-bowl burial, the bowls of Malwa painted ware placed horizontally in a row, the mouth of each, facing south; (iv) bowl-burials, with bowls of black burnished ware and a couple of stones placed on the top of the tumulus; and (v) single-urn burial, the burial urn being a carinated vase with splayed out mouth, covered with a lid of black burnished ware.

Among the other antiquities recovered from this Phase, mention may be made of copper tanged spearhead with mid-rib, a polished stone axe, bone points and microliths.

Phase V, belonging to the Jorwe Culture, yielded two potter's kilns, of which Kiln 1 was fully exposed. This kiln, 5 m square with corners rounded, is oriented northwest-southeast in alignment with the houses belonging to the early levels of the Phase. The 25-cm high platform of the kiln and its finely plastered flooring had a slope towards south. The kiln was found to be divided in to two compartments by a thin screen-wall, running north-south and varying in thickness from 3 to 5 cm. A mud-wall, with 1-40 m extant height and built of lumps of whitish earth, 50 cm at the base and 15 cm at the top, is provided all around the platform with a gap of 20 cm in between. A deposit of white and black ash mixed with earth was found between the platform and the mud-wall, as also above the platform. The inner wall showed thin layers of clay plaster, which because of direct contact with fire had got burnt. The kiln was found to have been filled with fine gravel which had turned brick-red in colour through burning. A large number of charred stumps of wood were encountered on the floor, in the gravel filling and in the holes of the inner burnt clay wall. Among the fifteen pots found on the flooring of the western chamber, one belongs to thick coarse ware while the remaining to the Jorwe Ware. The former pot is unique in having a pedestal base, squat globular body and splayed out mouth and decorated with applied designs on the rim, neck and shoulder, interesting being a group of eleven pointed oval dots on the shoulder. The Jorwe Ware pots represent, however, the usual types, some of the vases having so-called potter's mark which significantly enough differs in each case. A few pots were also found to bear graffito mark, consisting of a lattice pattern on the shoulder. A half-buried large jar of thick coarse ware with oval body, flat base and splayed out rim, profusely decorated on the exterior with applique designs such as series of arches, a human figure, humped bull, monkey and lizards, was found by the side of the kiln towards north-east. A number of small sub-angular stones bearing soot and burning marks were found inside this pot. These stones were perhaps used by the potter as weights over the grass, spread inside the kiln.

Kiln 2, which is partly exposed, lying about 1.0 m north-west of the above one, is similar in construction but differs in size.

Among the interesting finds from this Phase, mention may be made of a cube of trap

stone with patinated surface, resembling the weights usually found in association with the Harappan Culture. Other finds include: a thick, heavy copper bangle; beads of carnelian, agate and jasper; bone points; blades with or without retouch and fluted cores of chalcedony; and stone mullers, querns and balls of different sizes.

50. EXPLORATION IN DISTRICT BHANDARA.—Professor R. V. Joshi, Dr G. L. Badam and Shri Rakesh Prakash Pandey of the Deccan College Post-graduate and Research Institute, Pune, explored the river Pench near Naikund and collected Middle Palaeolithic tools from the river sections. Fine sections of fluvial deposits are exposed on the right bank of the river Pench. The tools are similar to those usually found in the Wainganga basin. Several Mesolithic localities were also found on the left and right banks of the river. The tools occur in the form of clusters on the slopes of small hillocks.

51. EXPLORATION IN DISTRICTS BHIR, SHOLAPUR AND NANDED.—In continuation of the, previous season's work *(1975-76,* pp. 34-35), Professor R. V. Joshi, Drs S. N. Rajaguru, R. S. Pappu and G. L. Badam of the Deccan College Post-graduate and Research Institute, Pune, in collaboration with S.R.T. College, Ambajogai, represented by Dr S. V. Chitale, continued exploration in the submersible area under Irrigation Dam at Dhanegaon on the river Manjra, a tributary of the Godavari, with a view to salvaging the archaeological remains. For this purpose even the adjacent areas of Andhra Pradesh and Karnataka states were also explored.

A large number of microlith-yielding sites were discovered on the planation surfaces ranging in elevation from 800 to 500 m above the sea level particularly at Barsi in District Sholapur, and Dharmpuri and Mukhed near Ambajogai in District Bhir.

In the Deccan Trap terrain, majority of tools are made on locally available chalcedony, while in the granitic area tools are made on chert and jasper which occur as siliceous segregations in the intertrappean formations. Outcrops of these siliceous rocks have been observed several kilometres away from the microliths' yielding sites. At some places like Barsi, one gets thickly patinated microliths along with non-patinated ones. Typologically the tool assemblage is represented by points and blades with a small amount of geometrical forms like triangles and lunates. Trapezes are absent. Patinated tools show Upper Palaeolithic characters in their thick and unretouched blades.

Several rich surface and a few stratified Middle Palaeolithic sites were discovered in the lower Manjra which flows in the border area of Maharashtra, Andhra Pradesh and Karnataka. Amongst surface sites, one of the richest factory site in the region was discovered near the outcrop of intertrappean fossiliferrous cherty ash bed at Metkonda in Andhra Pradesh. Typologically, this industry shows late phase of the Middle Palaeolithic, recalling Wainganga-B types in micro-blades and corresponding fluted cores as well as retouched large crescents and a few burins.

At Mugaon, an abandoned channel gravel, occurring in the left bank at a height of about 6 m above the modern bed level of the river Manyad, a northerly tributary of the Manjra, was found to be rich in fragments of fossil bones of *Bos* sp., *Cervus* sp. and *Sus* sp. and fresh tools showing typological characters transitional between the Middle and Upper Palaeolithic traditions. The gravel forms a part and parcel of an alluvial fill, about 15 m thick.

At Degloor in District Nanded (Maharashtra) and at Salura (District Nizamabad in Andhra Pradesh) a large number of Middle Palaeolithic tools were found in a cemented bouldery pebbly gravel (2 to 5 m thick) which rests on a weathered gneiss and is capped by yellowish brown *kankary* flood silt. At Degloor the gravel is rich in locally derived blocks and chunks of intertrappean cherts which have been used by Middle Palaeolithic man for making stone tools. Middle Palaeolithic artefacts are comparable to those generally met with at several sites in the Deccan. However, a special mention should be made of the collection at Salura which

contains large cores of prepared and unprepared varieties, unifacial (horse-hoofed type) and bifacial scrapers, unifacial handaxe type tools of flakes and large flake blades. In this respect this industry compares well with Wainganga-A types, indicating to some extent, end phase of the late Acheulian.

Occurrence of extensive primary laterite with an average thickness of 12 to 15 m in District Bidar (Karnataka) indicates that there was a humid phase with nearly 160 per cent increase in rainfall during the late Tertiary and early Pleistocene. General geomorphological, palaeontological and archaeological studies in the Manjra valley bring out following chrono-environmental framework for the area.

Geomorphic feature	*Palaeontological findings*	*Probable climate*	*App. age*	*Culture*
1. Distinct rejuvenation with limited alluviation in channels	_	Semi-arid monsoonic	Early to Holocene	Mesolithic
2. Distinct alluviation even in minor tributaries and in the source areas	*Bos, Equus*	Semi-arid monsoonic with frequent storm rains	Terminal Pleistocene	Late Middle Palaeolithic
3. Bed load braided rivers formation of gravelbars	*Bos, Cervus, Sus, Hippo*	Semi-arid monsoonic	Late Pleistocene	Early Middle Palaeolithic
4. Laterites	—	Sub-humid monsoonic	Late Tertiary to Early Pleistocene	—
5. Pediplains	—		Late Tertiary	—

52. EXPLORATION IN DISTRICTS KOLABA AND THANA.—Shri S. A. Sali of the South-western Circle of the Survey, carried out exploration in the Districts and observed near Akshi, on either side of the steel bridge on the Alibag-Revadanda road in District Kolaba, and exposed section on a creek varying in height from 2 to 3 m above the low tide level. The section consisted of partially consolidated beach sand mixed with numerous shells and capped by a light pinkish brown soil of about 40 cm thickness which was bereft of shells.

At the foot of the isolated hill, locally known as Hira Dongari in Bassein Taluk of District Thana, were found Middle Palaeolithic tools in association with water-worn pebbles. At present, the sea is about 2 km from the site. But, as per local information, an arm of the sea extended till recently in the low lying area a few metres to the west of the hill. Now the sea water has ceased to enter this low-lying area because of the construction of the bund at the mouth of the arm, for purposes of reclaiming the land for agricultural purpose. The observations suggest that during the Middle Palaeolithic times the sea was 5 to 6 m above the Mean Sea Level and not as away as at present from the site.

The artefacts, made on jasper, chalcedony, chert and agate, include vertically retouched scrapers on flat pebbles, scrapers on flakes, a Mousterian core, irregular cores and one burin. Occurrence of steeply retouched scrapers on flat pebbles in this industry makes it comparable to the Middle Palaeolithic industry of Badalpur in the Hiran valley on the Saurashtra coast.

An alluvial flat was observed 1.0 km west of the town Pen on the left bank of the river Jogeshwari in District Kolaba. The exposed sections revealed light reddish brown silt overlying

a deposit of sandy fine gravel and capped by another gravel deposit. The topmost gravel yielded a few blades, flakes and cores ascribable perhaps to the Mesolithic period. An interesting aspect of this flat was that it lay about 15 m above the present bed of the river Jogeshwari.

An exploratory dig at Revedanda, near Barbara's tower in District Kolaba, yielded pottery belonging to sixteenth-seventeenth century A.D., including Chinese porcelain and a red ware resembling in fabric and in general appearance to that of the mature Harappan.

53. EXCAVATION AT NAIKUND, DISTRICT NAGPUR.—The Department of Archaeology of the Deccan College Post-graduate and Research Institute, Pune and the Department of Archaeology, Government of Maharashtra, respectively under Professor S. B. Deo and Dr A. P. Jamkhedkar, carried out excavation at Naikund, 42 km north-east of Nagpur on the Nagpur-Parsivni road in Parsivini Taluk, on the left bank of the river Pencil where fifty-three stone-circles clustered in four localities were found. The largest stone-circle has a diameter of 26-3 m and the smallest 5.0 m. The local tradition has it that the circles represent either the burial of Laman king (a nomadic tribe) or a horse.

With a view to understanding the nature of stone-circles in different localities and their cultural relation, if any, with those excavated at Mahurjhari, Khapa, Junapani (in Vidarbha), these stone-circles in different localities were excavated: two in Locality I near the present village and one in Locality II situated on the bank of a nullah meeting the river Pench. Excavation revealed that the pattern of filling and planning of the stone-circles is common not only between Localities I and II but also with that in other excavated circles elsewhere in Vidarbha; below the pebble filling was jet black stickly clay which in turn capped a reddish soil or disintegrated *muram.* However, the most noteworthy feature of Naikund is that along with stone-circles, an extensive habitational deposit was also located, wherein similar remains were found.

In Locality I, two stone-cirlces were excavated. Megaliths 7 and 3, with a diameter respectively of 21.5 and 12.8 m, had a deposit of 1.5 m. Both these burials yielded only fragmentary skeletal remains indicating the fractional nature of the burials. However, both these contained a large number of pots of Black-and-red Ware, micaceous red (including a few painted ones) and coarse red wares along with copper bowls, dishes, lid finials (pl. XVIII A) with bird or triple bud motif, shallow dishes of iron, gold ornaments and horse bones. Mouth pieces and bits of iron for the horse were also found. Hoes, chisels and axes with cross-fasteners executed in iron were also recovered. The most noteworthy relic was a copper cup, rather deep and with horizontal side handle (pl. XVIII B). Among ornaments meant for horse were long copper tubes similar to those encountered in the stone-circles at Mahurjhari. At least one stone of each circle was found to have a series of well-arranged shallow circular cup-marks.

Excavation of the habitational mound, close to the left bank of the river Pench and adjacent to the stone-circles in Locality III, revealed 1.65 m deposit divisible into six layers. The deposit yielded abundant amount of Black-and-red Ware, micaceous red, painted black-on-red and coarse red wares. Associated with the top of layer 4 were remains of a floor made up of lime and clay, well-beaten and having circular post-holes. Along with pottery, a large amount of animal bones like those of cattle, horse, sheep, goat, pig and dog were collected in the habitational deposits, besides axes with cross-fasteners, hoes, dishes and daggers of iron. Typologically, these were identical with those from the stone-circles. Significantly enough copper was found to be scarce in the habitational deposits.

After Takalghat-Khapa, Naikund is the second habitational site of the Megalithic affiliation in the Vidarbha area of Maharashtra.

54. EXPLORATION IN DISTRICT NASIK.—In the course of exploration, Shri Arun Sabhlok and Dr S. N. Rajaguru of the Deccan College Post-graduate and Research Institute, Pune, carried out detailed study of Quaternary formations in the Upper Godavari valley, with a view

to providing a chronological and environmental framework for the Late Acheulian workshop-cum-occupation site reported earlier *(1976-77,* p. 38).

Alluvial cliffs, exposed on the banks of the Godavari and its northerly tributaries like Kadwa, Alandi and Unanda, were studied at Anjari (5 km downstream of Trimbakeshwar, the source of the Godavari), Anandwadi, Gangapur, Gangawadi (pl. XVIII C), 4 to 10 km upstream of Nasik, Dugaon on the river Alandi, Krishangaon on river Unanda, Niphad and Rolus on river Kadwa.

The Godavari flows on an ancient erosional surface (600-800 m) and has several knick points between Trimbak and Nasik. The Late Acheulian site of Gangapur is situated little down stream of the waterfall, developed due to discondant junction of two erosional surfaces. The tributaries of the Godavari are also upgraded, thereby indicating neotectonic movements in the region. There are two distinct alluvial fill surfaces, the older surface varies in height from 10 to 25 m and the younger from 3 to 5 m above the modern bed level.

Sedimentary facies of the older fill are characterized by channel gravels interlayering with brownish silty clays in the lower part of the alluvium. The upper part of the alluvium is characterized by overbank yellowish brown kankary flood silts with occasional lenses of point bar gravels. The younger fill consists of near channel brownish non-kankary flood silts. Preliminary field observations show that there was a major phase of alluviation right up to the source of the Godavari during the late Pleistocene. Even the present ephemeral streams were active and contributing considerable sediment load to the Godavari. The dating of the older fill is based on a few fossil bones (pl. XVIII D) found at an elevation of 3 m above the modern bed level in a brownish clay, exposed on the left bank of the river Kadwa near Rolus, 5 km upstream of Niphad. Dr G. L. Badam of the Deccan College Post-graduate and Research Institute, Pune, has tentatively identified following animal species.

(i) Hoofed animal, probably Rhinoceros, represented by three vertebrae, and

(ii) *Bos* sp. (?) represented by a fragmented skull.

On the basis of the geomorphological observations and palaeontological data one can date the Late Acheulian industry of Gangapur to the Late Pleistocene only.

55. EXCAVATION AT INAMGAON, DISTRICT PUNE.—In continuation of the previous season's work *(1974-75,* pp. 32-36), Drs Z. D. Ansari and M. K. Dhavalikar, assisted by Sarvashri Y. S. Rasar, C. G. Padwal, S. K. Kulkarni, Vishvasrao, V. K. Nagpure and M. G. Abhyankar, resumed excavation with a view to exposing as many houses as possible and studying the artefacts from within and from outside the houses, belonging to Period II *(circa* fourteenth to tenth century B.C.)

Altogether fourteen houses were unearthed (pl. XIX). They have low mud walls and mud-floors, the latter being periodically relaid. Six such floors were noticed in one of the houses. The largest house measured 12-20x7-55 m, with a room (7.10 X 3.90 m) in its south-eastern corner. Two rooms on the south and one on the west of the above room, all identical in dimensions but separated by each other by a 70-cm wide passage also belonged to this complex. To the north of the largest room was another room of the same size; it was the kitchen of the house as it contained a three-armed *chullah* of hard burnt clay, exactly similar to that used at present in the surrounding localities, and three big pit-silos respectively 1.35 m deep with 1.75 m diameter, 65 cm deep with 2.20 m diameter and 45 cm deep with 1.60 m diameter. All the pit-silos have perfect vertical sides and a flat bottom which was plastered with lime. A terracotta female figurine, decorated with punctured marks around the neck simulating a necklace or tattoo-marks, was found in a small hole in the centre of one of the silos. This figurine perhaps represents the fertility goddess.

A circular mud-platform, 1.73 m in diameter and 10 cm in height, meant perhaps to support a storage bin, was encountered in the western part of the kitchen. Even today, such

platforms can still be seen in the houses at Inamgaon, where thorny branches of *her* (jujube) and sand are placed inside before construction in order to prevent the rhodents from destroying the grain in the bin. A large oval-shaped fire-pit (1.20 X.0.72 m), containing a large flat-stone daubed with mud in the centre, was noticed in the same courtyard. Similar fire-pits were also exposed to the south of the large room. These were obviously used for roasting hunted animals.

All these houses could easily be taken as independent dwelling units. None of them, however, except the kitchen, had a *chullah* or storage facility, which are the basic requirements of the independant dwelling. All these structures, therefore, seem to form one large house-complex, consisting of several rooms lived by a large joint family.

Another house was noticed to the east of the above house-complex, separated by a 5-m wide road. It has two pit-silos of which one is quite large and deep. A lane of 1.50 m width and a house with two large pit-silos were noticed on the north of this house. To the west of these, another rectangular house was partly exposed.

A number of burials were encountered in the course of excavation. The children were buried in two grey ware urns placed horizontally mouth-to-mouth, in a north-south direction. Funerary furniture were placed within the burial pit. In the case of adults, the body was placed within the pit in a north-south direction along with funerary vessels. Usually, the portion below the ankle of the dead body was chopped off but in one case the lower extremities were intact. Another noteworthy feature noticed in this season's work is that in many cases the dead bodies of children as well as adults were found wrapped in grass before burying. In one burial, possibly of a female, a necklace of paste beads was found around the neck, while in another a necklace of copper beads of long barrel shape was found (pl. XX A). The latter burial belonged to a child.

The pottery obtained from the season's work belonged broadly to three groups namely the black-on-red painted Jorwe Ware, the coarse red/grey and thick handmade wares. Among these, two *chalices* of painted Jorwe Ware are noteworthy (pl. XX B). Blade and flake tools of chalcedony and a few polished stone tools were also collected.

56. EXCAVATION AT PANHALEKAZI, DISTRICT RATNAGIRI.—Sarvashri L. S. Rao and G. V. Vidwans, assisted by Shri S. R. Gosavi of the South-western Circle of the Survey, conducted excavation at Panhalekazi with a view to exposing rock-cut caves. The excavation revealed two rock-cut chambers and a platform with a covered drain. Of the two open chambers exposed by the side of Cave 16, one measures 2.13 X 1.70 m and another 1.7 X 1.52 m. A rectangular pedestal with socket was found lying near the entrance of the larger chamber, in addition to the one at the back side wall of the chamber. A sculpture of an attendant and a fragment of a *prabhavali,* bearing broken feet and a figure of an attendant besides a pedestal at the back wall were encountered in the smaller chamber. An interesting feature of the plan is that both the chambers are provided with circumambulatory passages.

Excavation on the top of Caves 6-9, exposed a platform (12.19 X 6.70 m), partly carved out of bed-rock and partly constructed with rectangular stone blocks. A wall (12.19.X.0.90 m) constructed of dressed blocks of stone was found behind the platform. A drain cutting across the platform and continuing beyond the wall, was found covered with horizontally placed rectangular stone slabs on the platform. Beyond the wall the slabs were found arranged in such a way that the back side of the succeeding slab fitted into the specially made groove on the preceeding slab. The last covering slabs of the drain with a shallow depression covered a projecting hole in the rock measuring 15 cm in diameter. This hole perhaps represented a natural spring water which was channelized through this drain and was bifurcated into shallow channels on the facade of Cave 9. A pedestal with square socket, probably meant for fixing the stupa, now lying in front of Caves 6-9, was encountered adjacent to the above platform.

A few pieces of coarse red ware, a copper coin, a thin circular sheet of copper and a broken stupa were also collected from the excavation.

57. EXPLORATION IN DISTRICT SHOLAPUR.—In the course of exploration, Shri S. N. Raghunath of the South-western Circle of the Survey, discovered Middle Palaeolithic sites at Dharang, Kakraje, Khanapur and Shegaon and sites yielding microliths at Chichpur, Kuyal and Siddhatek.

MEGHALAYA

58. EXPLORATION IN DISTRICT GARO HILLS.—Dr S. N. Rajaguru of the Deccan College Post-graduate and Research Institute, Pune, Professor M. C. Goswami, Drs T. C. Sharma, H. C. Sharma and Shankar Roy of the Department of Anthropology, Gauhati University and Shri Dilip K. Medhi of Arya Vidyapeeth College, Gauhati carried out reconnaissance survey of Quaternary formations in the Garo Hills with a view to preparing a background of Quaternary Geology to the Stone Age sites reported earlier.

The exposed Quaternary deposits were examined in the valleys of the rivers Rongram (a tributary of the Ganol), the Jinjiram, the Simsang, the Waram (a streamlet of the Rongram), at places like Anogiri, Baghmara, Bajengdoba, Chibragiri, Damalgiri, Garobadha, Michimagiri, Rongram, Ronsenggiri, Simsanggiri, etc.

The Garo Hill has preserved four or five major erosional surfaces cut on early Tertiary and pre-Cambrian rocks. The various surfaces meet on the interfluves of mountain streams with conspicuous knick points in the form of waterfalls. Thick (30-50 m) alluvial fills are observed in youthful valleys such as that of Rongram below 800-600 m surface. There are two conspicuous valley fill terraces present in most of the streams. These two terraces are unpaired type, following the meandering pattern of a stream and occur at an average elevation of 25 and 5 m respectively. The younger terrace is inset into the older terrace having a thicker alluvium. The basal part of the older fill consists of unsorted deeply weathered bouldery/pebbly gravels and has yielded Stone Age tools around Rongram. The upper part of the fill predominantly consists of overbank reddish acidic silts. The basal gravel of the younger fill is relatively unweathered and the overlying silts are brownish in colour.

In the absence of any reliable dating material, the older fill cannot be dated precisely. However, the occurrence of this fill in the valleys cut into late Tertiary surface suggests that they are of Quaternary age only.

Geomorphic features such as rejuvenation of the present streams, presence of abandoned gravel channels at elevations ranging in height from 30 to 5 m above the present bed-level of streams, disconcordant junctions of tributaries and the occurrence of various erosional surfaces indicate neotectonic activity in the area.

On the other hand large scale alluviation right into the source region of mountain streams probably indicates Quaternary climatic changes, the nature of which is not yet understood properly.

Dr H. C. Sharma of the Department of Anthropology, Gauhati University, conducted exploration for collecting Stone Age tools, and discovered some pebble tools *in situ* at Nangalbibra in the valley of the river Simsang (Someswari). Besides, three terraces at the height of 2, 6 and 8 m were noticed. The lowest of these terraces was found to be implementiferous, yielding three pebble tools of chopper-chopping complex from the gravel layer in the section exposed at the confluence of the rivers Simsang and Nangal. The gravel layer (1-5-m thick) rests on the hornblend schist and is unsorted, pebbly, weathered, completely eroded and fully consolidated. This layer is partly covered by modern sandy alluvium. Further, another brownish clayey silt of 1-5 m thickness, covered by a mantle of humus, was observed.

Considering the geomorphic features of the area as well as the basis of the observations made at various places of the District, it may be inferred that the implementiferous gravel layer belongs to the Middle Pleistocene period.

PUNJAB

59. EXCAVATION AT SANGHOL, DISTRICT LUDHIANA.—In continuation of the previous season's work *{1972-73,* p. 28), the Department of Tourism, Cultural Affairs, Archaeology and Museums, Government of Punjab, resumed excavation under the supervision of Shri G. B. Sharma, with the two-fold objective of: (i) establishing the cultural sequence; and (ii) ascertaining the relationship between the late Harappan and the Painted Grey Ware cultures. The excavation revealed four periods of occupation, of which Period I is divisible into three phases A, B and C.

Period IA, represented by 20-cm thick deposit, devoid of any structures, belongs to the late Harappan culture. Floors with post-holes and hearths were encountered. The pottery, mainly recovered from the pits which were filled with ash, is of Bara lineage showing characteristic incised decorations. The incised decoration on the pottery appears from the beginning.

Period IB, represented by a 3-10-m thick deposit, also belonging to late Harappan culture, is marked by structures of mud-bricks (40x20x10 cm), showing three phases. Among the exposed structures was one which could be identified as potter's house. The supports, made of fine clay and fixed in the ground, on which the potter's wheel might have been revolved, were found at three places. A pit, probably used as storage bin, was found in the house. The pit (1 -55 m dia. and 63 cm deep) seems to have been widened and provided with mud-brick lining at a later stage (pl. XXI). In the second phase of the potter's house, an oval-shaped hearth and a kiln were noticed. In another trench was found a fire-altar, divided into two parts containing ash and unbaked and semi-baked cakes. The ceramic industry is represented by Bara ware with a wide range of forms, fabrics, dressed surfaces and painted motifs.

Period IC, represented by a 1-10-m thick deposit, belongs to the overlap phase between the late Harappan and the Painted Grey Ware cultures. Painted Grey Ware and its associated wares including grey and red wares account for 30 per cent (in the lower level) and 70 per cent (in the upper level) of the total pottery recovered. A baked-brick (26 X 22 X 10 cm) was encountered in this phase.

Period II, represented by a 70-cm thick deposit, is distinguished by the use of Painted Grey Ware and its associated wares besides black-slipped ware. There is no evidence of structures except a few post-holes.

Period III, represented by a 1-40-m thick deposit, belongs to the black-slipped ware culture and is marked by the occurrence of structures of mud-bricks. The structural activity is divisible into four phases, of which the structures of the first three phases are built of mud-bricks measuring 36 X 22 X 8 cm and of the fourth of 40x26x8 cm. The excavation revealed that the structural activity started on a rammed earth platform. Important antiquities recovered include: terracotta beads (ghata-shaped) and animal figurines; ivory bangle pieces; and beads of paste.

Period IV, with a deposit of 2.85 m, represented by structural activity divisible into six phases, belongs to early historical times. The orientation of houses remains the same as in those of the preceding period. The structures are of both baked and unbaked bricks of the size 33 X 22 X 7, 37 X 22 X7 and 33 X 20 X 6 cm. The ceramic industry is represented by vases with stamped design and incurved bowls. Black-slipped ware also occurs in a small quantity. Antiquities recovered from this Period include: beads of terracotta and semi-precious stones; stone arrowheads; terracotta animal figurines, including bull, lion, etc.; ivory combs; copper

antimony rods; and coins of Gondophernes and Vima Kadphises. The occupation in this area seems to have come to an end after the Indo-Parthian or early Kushana period.

The excavation on the eastern side of the village revealed habitational deposit showing baked brick structures and a covered drain belonging to the Gupta period. Red Polished Ware is the dominating ware of the ceramic industry. A number of sealings of clay with a legend in Brahmi characters of fourth-fifth century A.D. were obtained from the occupation levels. Some of the sealings show spoked wheel on the top and the legend *Srir Maharaja Kapila Niyuktasyadhikarnasya* on the bottom, probably belonging to some governor or a feudatory king of the Guptas. The earliest occupation here perhaps belongs to the Kushana times.

Excavation in the area where a stupa had been noticed earlier, revealed a circular well-like structure of 6.35 m diameter and 92 cm width, which could not be properly identified. Other structures unearthed include brick-paved floors, verandahs, rooms, etc. Noteworthy find, however, was a red stone panel, depicting a *Jataka* story of renunciation of Buddha on one side and of Amarpali (?) on the other. On stylistic basis, this may be dated to early Kushana times. The pottery recovered from this area belongs to Sunga-Kushana times. Some coins of Soter Megas and Vima Kadphises were also obtained.

60. EXPLORATION IN DISTRICTS LUDHIANA, PATIALA, ROPAR AND SANGRUR.—In the course of exploration, Shri Ganga Bishan Sharma of the Department of Tourism, Cultural Affairs, Archaeology and Museums, Government of Punjab, noticed the following sites.

(LH=LATE HARAPPAN; PGW=PAINTED GREY WARE; GW=GREY WARE; BSW=BLACK-SLIPPED WARE; EH=EARLY HISTORICAL; AND M=MEDIEVAL)

District	*Taluk*	*Village/Site*	*Cultural assemblage*
Ludhiana	Samrala	Bhamian	GW, M
-do-	-do-	Chandiala	LH, M
-do-	Payal	Katana	LH, GW, BSW, EH
-do-	-do-	Payal	EH
Patiala	Amloh	Brihma	M
-do-	-do-	Galbadhi	LH, M
-do-	-do-	Kumbhara	LH, PGW, GW, BSW, M
-do-	-do-	Majri Jattan	LH, PGW, GW, BSW, M
-do-	-do-	Salana	PGW, GW, BSW, M
-do-	Nabha	Mandaur	M
-do-	Patiala	Dadhera	PGW, GW, M
-do-	-do-	Kalwan I	M
-do-	-do-	Kalwan II	LH, M
-do-	-do-	Kalyana	EH, M
-do-	-do-	Lachkani	LH, M
-do-	-do-	Nandpur Kesho	EH
-do-	-do-	Pinaundian	LH, EH, M
-do-	-do-	Suniarheri	LH, PGW, GW, BSW
-do-	-do-	Uchagaon	LH, EH
-do-	Rajpura	Godda Majra	M
-do-	-do-	Hulka	EH
-do-	-do-	Jhansla	PGW, GW, EH

District	*Taluk*	*Village/Site*	*Cultural assemblage*
Patiala	Rajpura	Kalauli	M
-do-	-do-	Kotla	M
-do-	Sirhind	Attewali	M
-do-	-do-	Brass	PGW, EH
-do-	-do-	Chinarthal Kalan	LH, GW, BSW, M
-do-	-do-	Dhangeri	LH, M
-do-	-do-	Hansali	LH, PGW, BSW
-do-	-do-	Isanhel	LH, EH, M
-do-	-do-	Jalbehri Dhumi (Thehwali)	M
-do-	-do-	Kalaur	PGW
-do-	-do-	Lataur	LH, PGW, GW, M
-do-	-do-	Manhera	M
-do-	-do-	Mullanpur I	EH
-do-	-do-	Mullanpur II	GW
-do-	-do-	Pirjan	M
-do-	-do-	Rai Majra	M
-do-	-do-	Sheikhupura	PGW, GW, M
Ropar	Ropar	Bassi Gujaran	LH, EH
-do-	-do-	Kila Kandela	M
-do-	-do-	Manela	LH, GW
-do-	-do-	Panjaula	PGW, GW
Sangrur	Malerkotla	Bahwa	LH, GW, BSW
-do-	-do-	Bhasaur	LH, PGW, GW, EH, M
-do-	-do-	Mahorana	LH, PGW, GW, BSW, EH
-do-	Sunam	Changli	EH
-do-	-do-	Gaggarpur	EH, M
-do-	-do-	Gobindgarh Khokhar	EH, M
-do-	-do-	Jamhera-da-theh	EH, M
-do-	-do-	Mardkhera	EH, M

61. EXPLORATION IN DISTRICT ROPAR.—In the course of exploration, Sarvashri Kulbushan Kumar Rishi and Vipnesh of the Department of Tourism, Cultural Affairs, Archaeology and Museums, Government of Punjab, brought to light sites yielding Lower Palaeolithic tools on the foothills of the Shivaliks in the Sutlej region. Sites at Kror and Sunk yielded choppers and scrapers whereas Bari Nagal, Ghurha and the site between Nanakpur and Ramanpur yielded choppers, scrapers and cores. At Siswan only cores were collected.

Exploration in the Trans-Sutlej region yielded many sites. The sites Dolian Choe and Taprian yielded choppers and scrapers whereas Khatane and Rajagiri yielded choppers, scrapers and flakes. Tools like unifacial and bifacial choppers and flakes were recovered from Jatwar and Jhandia, while from Basoli, Tibba Nangal, besides unifacial and bifacial choppers and scrapers, flakes were also collected. The sites at Chandpur and Mankoli are interesting as they yielded handaxe and cleaver, besides unifacial and bifacial choppers, scrapers and flakes.

RAJASTHAN

62. EXPLORATION IN DISTRICTS AJMER, BARMER, JALOR, JODHPUR, NAGAUR AND PALI.—In continuation of the last year's work *(1976-77,* p. 45), a team, consisting of Drs V. N. Mishra,

S. N. Rajaguru and P. K. Thomas of the Poona University and the Deccan College Post-graduate and Research Institute, Pune, Drs D. P. Agrawal, R. K. Pant and Shri R. V. Krishnamurthy of the Physical Research Laboratory, Ahmadabad, and Dr R. P. Dhir of the Central Arid Zone Research Institute, Jodhpur, carried out a reconnaissance survey of Stone Age sites with a view to understanding the Stone Age sites in the context of geomorphology, palaeoclimate, ethnoarchaeology and ethnobotany.

Rich microlith yielding sites were discovered on the stabilized surfaces of moderately calcreted yellowish brown dunes (Obstacle and Barchan types) at Jalor and Sokarna, 8 km east of Jalor in District Jalor, on the western shore of Pachpadra lake in District Banner, at Dhechu in District Jodhpur, at Belaser, 74 km west of Jodhpur and at Nand and Nelya in the Pushkar valley in District Ajmer. At these sites, locally available materials like rhyolite, fine-grained quartzite, quartz, chert and chalcedony have been used for making tools. The presence of large number of bone fragments along with microliths in small numbers were also attested on the dunes near Nanawas in District Jalor. On the basis of pedogenesis these dunes do not appear to be very old, probably not earlier than early Holocene. Aeolian activity seems to have continued even during the early Holocene in this part of Rajasthan.

Middle Palaeolithic tools have been collected from a stratified context at Jael in District Nagaur. Tools occur in a piedmont gravel at the foot of a low hill range in an otherwise pedi-mented landscape. Tools are made on quartzite and mainly comprise flakes, side scrapers and end scrapers. Occasionally miniature handaxes are also found. The presence of small blades and cores suggests that the site continued to be in use during later times as well. Fairly rich surface sites of Middle Palaeolithic and Mesolithic age, mostly near the source of raw material have been found at Mogra hill, 24 km south of Jodhpur, Mokharia, 8 km south of Phalodi, at Shergarh tri-junction (Jodhpur-Shergarh-Jaisalmer roads), Nakhoda temple near Balotra, Malhar in District Jodhpur and on the river Reria in District Pali.

A few Lower Palaeolithic tools, including a fine cleaver, were discovered in a well-cemented hill-slope deposit, occurring in a cutting of an irrigational canal near Bhadrajum, 23 km south-west of Pali.

The area under consideration is of low relief and is dominated by semi-arid to arid climate. The present composite landscape is marked by vast pediments, coarse and shallow drainage lines, flanked by flood-plain dunes, dissected obstruction dunes, formed on the windward steep slopes of pre-Cambrian hills, vast salt lakes *(playas)* and pavement gravels, rich in ventifacts and pebbles with desertuarnish. The Luni, the only semi-perennial stream is allochthonous and complicates the landform history. Palaeoforms include prior channels carrying pebbles and boulders (commonly observed at a depth of 4 or 5 m below the saline lake beds at Malhar and interlayered aeolian and fluvial formations of the hillslope zones. Moderate degree of calcification and the yellowish brown colour of majority of dunes suggest that they arc not very old, definitely later than Middle Palaeolithic tool bearing prior channel gravels. This preliminary observation shows that the south-western part of Rajasthan has preserved complex palaeoclimatic history. The region does not seem to have experienced hyperarid or humid climates during the Quaternary. The area, therefore, provided a congenial ecological setting for the habitation of early man since late Acheulian times.

63. EXPLORATION IN DISTRICT BHARATPUR,—In the course of exploration, Shri B. S. Negi of the Delhi Circle of the Survey discovered sites yielding Painted Grey Ware at Babain, Bagdhari, Bhandor, Birawi, Sewer, Sinpini and Tatamar. Besides, early historical pottery was collected from all the sites and a few sherds of black-and-red ware from Sewer.

64. EXPLORATION IN DISTRICT GANGANAGAR.—In the course of exploration, Shri K. N. Dikshit, assisted by Shri R. S. Sharma of the Excavations Branch (II) of the Archaeological

Survey of India, revisited the sites explored earlier by Shri A. Ghosh, from Bhadra to Anupgarh, and noticed that Sherpura, lying between Bhadra and Siswal, with an extant occupational deposit of 50 çm, yields all the pre-Harappan fabrics, identified at Kaliganban *(1962-63,* pp. 20-31), except 'E'. Fabric 'A' dominates the ceramic industry of the site. Some sherds of perforated vases and terracotta objects like cakes, bangles, bowls and cart-frame were also collected.

At Sothi and Nohar, which are predominantly pre-Harappan sites, Harappan material was also noticed. These sites have an occupational deposit of 1 to 1-30 m, and the dominant fabrics in the ceramic industry of the pre-Harappan are 'C' and 'D'. However, at Nohar where the fabrics 'A' and 'F' are conspicuous by their absence, the Harappan material is compartively more.

The pre-Harappan material collected from the sites beyond Kalibangan up to Anupgarh is limited, exception being Bugia (GB 38) which revealed pre-Harappan and Harappan fabrics. Extensive twin mounds revealed only Harappan material, similar is the case with other sites like GB 94, 25, 93, 80, 72, 87 and 43 which are situated between Suratgarh and Anupgarh.

65. EXPLORATION IN DISTRICTS JHUN-JHUNU AND SIKAR.—Shri K. N. Dikshit of the Excavations Branch (II) of the Survey assisted by Sarvashri Lai Chand Singh, R. S. Sharma and B. R. Meena, explored from Nim-ka-Thana to Pilani, an area of about 70 km on both sides of the river Kantli which flows from south to north and crosses the Districts Jhunjhunu and Sikar (fig. 7), and brought to light the following sites.

(OCP=OCHRE-COLOURED POTTERY; BRW=BLACK-AND-RED WARE; PGW=PAINTED GREY WARE; AND RM=RANG MAHAL)

District	*Village/Site*	*Cultural assemblage*
Jhunjhunu	Aruka	RM
-do-	Bharunda Kalan	RM
-do-	Bharunda Khurd	RM
-do-	Bhatiwar	RM
-do-	Budh	RM
-do-	Chhawshri	RM
-do-	Gada Kheda	RM
-do-	Gadhala	RM
-do-	Gori Budha	RM
-do-	Hansalsar	RM
-do-	Hukumpura	RM
-do-	Jahaj (Pachlangi)	RM
-do-	Ked	RM
-do-	Marot-ki-Pahari	RM
-do-	Matana	RM
-do-	Narhad	RM
-do-	Natas	RM
-do-	Shivanathpur	RM
-do-	Singhana	RM
-do-	Sonari-ka-Ghat	BRW, PGW, RM
-do-	Tara-ka-Bas	RM
-do-	Udaipur Wati	RM

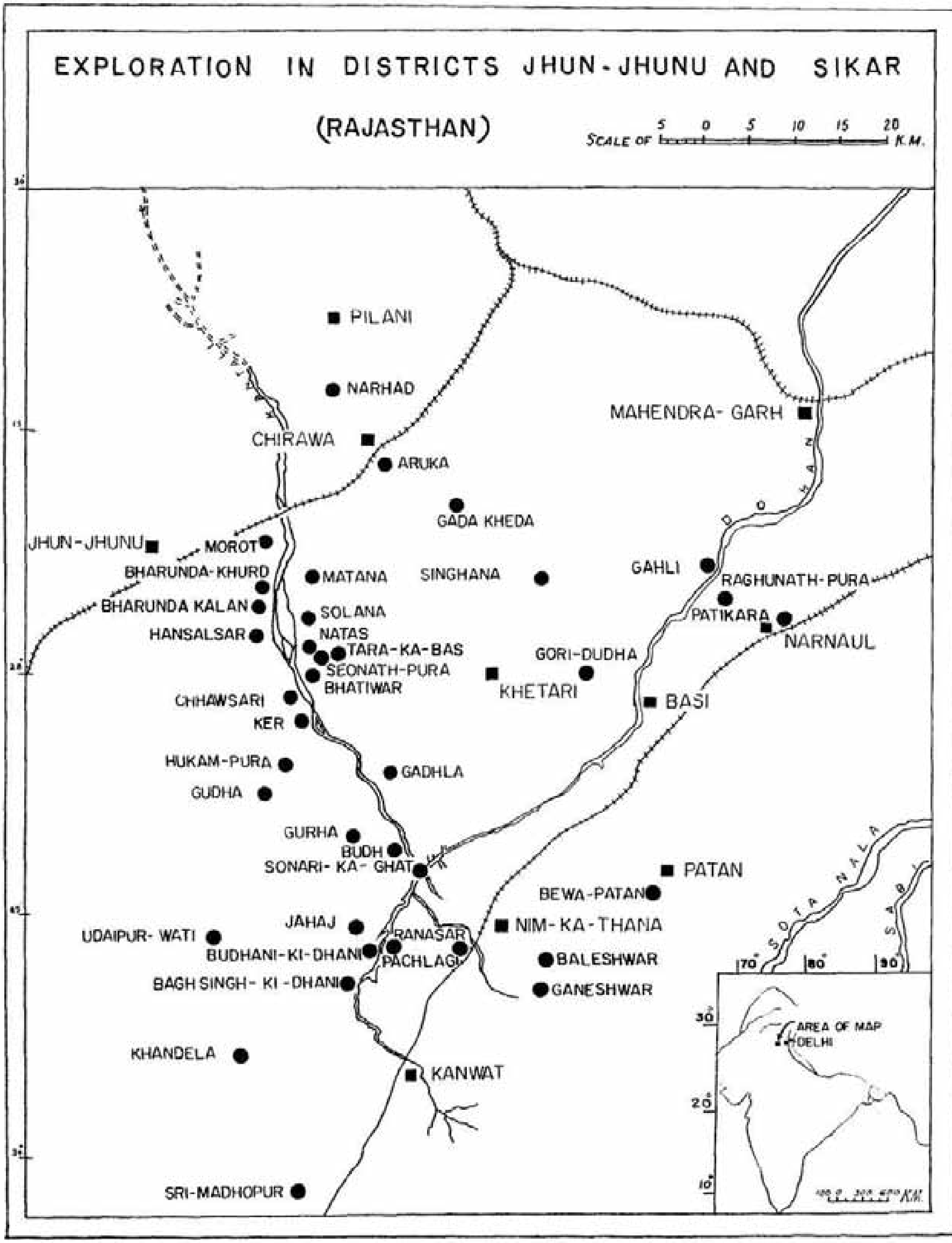

EXPLORATION IN DISTRICTS JHUN-JHUNU AND SIKAR
(RAJASTHAN)
SCALE OF K.M.
PILANI
NARHAD
CHIRAWA
ARUKA
GADA KHEDA
MAHENDRA- GARH
JHUN-JHUNU
MOROT
BHARUNDA-KHURD
MATANA
SINGHANA
GAHLI
RAGHUNATH-PURA
BHARUNDA KALAN
SOLANA
PATIKARA
NARNAUL
HANSALSAR
NATAS
TARA-KA-BAS
GORI-DUDHA
SEONATH-PURA
BHATIWAR
KHETARI
BASI
CHHAWSARI
KER
HUKAM-PURA
GADHLA
GUDHA
GURHA
BUDH
SONARI- KA- GHAT
PATAN
BEWA-PATAN
JAHAJ
NIM-KA-THANA
UDAIPUR- WATI
RANASAR
BUDHANI-KI-DHANI
PACHLAGI
BALESHWAR
BAGH SINGH- KI -DHANI
GANESHWAR
KHANDELA
KANWAT
SRI-MADHOPUR
AREA OF MAP
DELHI

FIG. 7

District	*Village/Site*	*Cultural assemblage*
Sikar	Baleshwar	OCP (?), RM
-do-	Bewa Patan	RM
-do-	Ganeshwar	OCP
-do-	Guhala	RM
-do-	Khandela	RM
-do-	Ranasar	RM
-do-	Shrimadhopur	RM
-do-	Trilokpura	RM

Besides, a few sites were also explored on the river Dohan. Ancient copper-mining sites such as Singhana, Khetri, Udaipur and Dariba were also visited, and it was noticed that the sites yield only Rang Mahal pottery, except Baleshwar where the pottery possibly belongs to earlier times.

66. EXPLORATION IN DISTRICT SIROHI.—In the course of exploration, Sarvashri V. H. Sonawane, R. J. Khatri, R. C. Sutaria, N. M. Khatri, G. U. Bhagat and R. R. Kahar, under the guidance of Professor R. N. Mehta of the Department of Archaeology and Ancient History, M. S. University of Baroda, collected microliths including varieties of cores, waste flakes, scrapers and blades of chert, chalcedony and carnelian, from the left bank of the river Banas near its confluence with the Sivalan or Chandravati. One of the short cylindrical fluted cores has a diamond-shaped incised design with five concentric diamonds. The design is incised on the cortex of the core by some sharp point. The long parallel-sided flakes obtained from the site are capable of producing such designs. Besides, they also identified the ancient town Chandravati, known as the capital of the Abu branch of the Paramaras.

Chandravati, presently a small village, 7 km south of Abu Railway station on the Ahmadabad-Delhi route, situated on the left bank of the river Banas, little away from the confluence of the Banas and the Chandravati, is on the main highway connecting Gujarat with Rajasthan. The ancient township (1.0 km sq) is situated on the second terrace of the river Chandravati. It had five main roads dividing the residential area into six rectangular main blocks. The longest road (no. 1) running north-south, parallel to the eastern hillock, was about 800 m broad. The other four roads varying in length and breadth, running east-west, joined the main road at angles of 90° or 45°. All the east-west running roads lead to the river Chandravati. The whole habitational area was strewn with material remains and structural debris of residential and religious buildings. The residential buildings showing compound walls were located on either sides of the main roads on which were the main openings. About forty-five structural units were marked in the habitational area. Besides, thirty-four temples were also noticed, standing in various state of preservation, of which sixteen Saivite, four Vaishnavite^ one of Brahma and ten Jaina temples were identified while the remaining three temples could not be identified. They are planned on the principle of rectangular offsets of *bhadra, pratibhadra* and *karna.* The *panchayatana* temples were also similar in plan and arranged on a single *jagati.* Some of the temples have additional *torana.* Step-wells, circular wells, water reservoirs and tanks were noticed in the habitational area. Pottery, coins and household stone objects, terracotta objects, etc., were collected from the residential area.

The northern end of the Chandravati was marked by a 250-m square fortified area. The fort-wall was of about 2 m thick. The interior of it is entirely destroyed by agricultural activities. Probably this was an important administrative or military unit.

TAMIL NADU

67. EXCAVATION AT MALLAPPADI, DISTRICT DHARMAPURI.—The Department of Ancient History and Archaeology, University of Madras, under the direction of Professor K. V. Raman, assisted by Drs C. Krishnamurthy, A. Swamy, S. Gurumurthy and P. Shanmugam as well as the students of the Department, excavated a megalithic habitation site and a rock-shelter. Altogether six trenches, MPD-1 to 6, at various places and rock-shelter were excavated.

The excavation revealed that the earliest occupation belongs to the Megalithic Culture but with some lingering traits of the neolithic culture represented by Black-and-red Ware, red, red-slipped and black wares. Occurrence of a pottery head-rest along with the neolithic grey ware is particularly interesting. Two fragmentary saddle querns of granite were also recovered from this level.

The next occupational level also belongs to the Megalithic Culture but without any neolithic elements, and yielded Black-and-red Ware, red-slipped, red and black wares.

The third occupational level is datable to the early historical times, and yielded Russet-coated Painted Ware along with black-and-red, red and black wares.

The fourth occupational level belongs to the medieval times.

A rock-painting (pl. XXII A) in white kaolin, depicting the scene of two horse-riders, fighting with poles in their hands was noticed on the low ceiling of one of the rock-shelters. Another human figure with upraised arm holding a stick or a weapon was also noticed.

68. EXPLORATION IN DISTRICT NORTH ARCOT.—In the course of exploration, Shri Hanumanthappa Telagu of the Southern Circle of the Survey noticed sites along the foot of the Jawadi hill range in Chengam Taluk, yielding polished stone axes at Kilasilambadi, Kilvilampuchchi, Kuttathur, Palaya Talur and Urkkavundanur.

More than five hundred megalithic cairn-circles, ranging between 1-0 to 3-0 m in diameter, were noticed east of Konakotta. A megalithic habitation site, with an occupation deposit of 1-5 m yielding Black-and-red Ware and other associated wares was located south of the same village. Besides, cairn-circles were noticed at Arattavadi, Melravandavadi, Munnurmangalam, Vasudevanbattu and Pudur, and dolmens at Attipattu and Valakkad. An urn-burial site was noticed at Nippatturai on the bank of the river Ponnaiyar.

Early historical habitation sites were noticed at Ammapalayam, Andipatti, Karapattu, Krishnapuram, Kuppanatham, Nippatturai and Paramanandal. The last-mentioned site yielded the Russet-coated Painted Ware besides early historical pottery. A habitation site, datable to the medieval times, was also noticed at Valayambattu which yielded glazed ware.

A temple, dedicated to Vishnu, and two temples, dedicated to Siva, all ascribable to the late Chola period (twelfth-thirteenth century A.D.) were noticed at Mudiyanur Tamaraipakkam and Pannaiolaippadi respectively.

69. EXCAVATION AT KAVERIPATTINAM, DISTRICT THANJAVUR.—In continuation of the previous season's work *(1973-74,* p. 25), the Southern Circle of the Survey resumed excavation in the locality known as Pallavaneswaram with a view to fully exposing the structures such as *vihara* and the shrine.

During the course of excavation, stucco figures, which had probably adorned the walls of the shrines, as well as moulded bricks were recovered. Of the stucco figures noteworthy is the head of Buddha encountered at a depth of 1-10 m and *a yali*. Some of the stucco figures show traces of paintings in green and red pigments. Other important antiquities recovered include: terracotta figurines; beads of jasper and terracotta; shell bangles; and a stone trough.

UTTAR PRADESH

70. EXPLORATION IN DISTRICT AGRA.—In the course of exploration, Dr Arun Kumar, assisted by Sarvashri L. M. Wahal, C. B. Mishra and Pramod Singh of the Northern Circle of the Survey noticed a mound, 44 km from Agra on the Agra-Firozabad road, yielding pottery belonging to early centuries of the Christian era and medieval period, besides a few fragmentary sculptures in sandstone, datable to tenth-eleventh century A.D. Another mound was noticed near Tundla railway crossing, 18 km from Agra on the Agra-Tundla road, yielding early historical and medieval vestiges.

71. EXCAVATION AT FATEHPUR SIKRI, DISTRICT AGRA.—In continuation of the last year's work *(1976-77,* pp. 48-49), the Northern Circle of the Survey, under Shri W. H. Siddiqi, assisted by Sarvashri K. P. Poonacha, Dhanpat Rai, S. K. Lekhwani, Y. K. Sharma, S. K.Jain, C. P. Singh, C. P. Satsangi, Chiranji Lai and R. M. Saigal, resumed excavation in FPS-I and FPS-II. Besides, the entire area within the city walls as well as areas outside the fortification was thoroughly explored, preliminary to the excavation. In the process, traces of roads and by-lanes, tanks, public baths, etc., were plotted.

Excavation in FPS-I, situated to the east of Badshahi gate on the slope, revealed remains of two rubble structures, rectangular on plan. The walls were found to be plastered with fine lime as evidenced from the extant patches. The structures are oriented east-west with entrances opening on the south. Of the two structures, Structure 1 consists of three big rooms and a small room which is a typical example of the medieval secular structures. The ceramic industry consists mainly of plain red ware as well as painted black-on-red and glazed wares. The pot-forms represented in plain red ware are: vases *(guldastas),* basins *(taslas),* storage jars, bowls *(pyalas* and *katoras),* and miniature pots *(paimane).* The glazed ware is represented by shallow dishes *(rikabi),* often painted in bright colours depicting floral motifs. Important antiquities recovered from the digging include terracotta animal figurines and a few glass beads.

The excavation in cutting FPS-II, exposed a large house-complex consisting of three big rooms, a bath, two dry latrines, two big out-houses and a large courtyard with an octagonal tank. Occurrence of water chutes leading to the courtyard probably suggest the presence of a small garden. A large rectangular room built of bricks (size: 25 X 25 X 5, 20 X 20 X 5 and 15 X 12 X 4 cm) was exposed to the south of the above structures. Both interior and exterior surfaces of the walls seem to have been initially given a mud-wash over which is applied thick lime plaster, decorated up to the dados. The walls contain series of recesses with an entrance at the south. Lintels and jambs are of stone. The structures seem to have had a domical roof as evidenced from the available data. A large number of mica flakes, cut into various geometrical designs, used perhaps for embellishing the ceilings of the private chambers, was found in this area. The ceramic industry includes glazed, Chinese porcelain, black-on-red and thin grey wares. Thin grey ware of fine fabric which represents the deluxe ware of the assemblage, shows incised and painted decoration of floral, geometrical and criss-cross patterns. A few sherds of fine polychrome ware, bearing paintings in bright colours were also found. Other important antiquities recovered include: copper rings and five coins; terracotta human and animal figurines; a thin gold coil; iron objects including chisel, hammer, fish-hooks, horse saddle, arrowheads; and glass objects such as beads, fragments of bangles and *surahis.*

72. EXCAVATION AT CHOPANI-MANDO, DISTRICT ALLAHABAD.—In continuation of the previous season's work *(1966-67,* p. 38), Sarvashri B. B. Misra and Ranjit Singh under the general supervision of Professor G. R. Sharma of the Department of Ancient History, Culture and Archaeology, University of Allahabad, resumed excavation with a view to ascertaining the

the nature of deposits and salient features of different phases. The excavation revealed a threefold sequence of cultural phases in a 1-55-m thick deposit (pl. XXIII A).

Phase I (Epipalaeolithic or late Upper Palaeolithic) is transitional in character, yielding twenty per cent of Upper Palaeolithic and eighty per cent of early Mesolithic tools. Tool repertoire, consisting of parallel-sided and blunted backed blades, scrapers, borers and burins, made on cherty material (pl. XXIV A), besides flakes and cores, is marked by large size and bold retouching when compared with the succeeding Mesolithic industry.

Phase II A (Early Mesolithic) is characterized by non-geometric microliths, without pottery. The lithic assemblage comprised parallel-sided blades, blunted backed blades, scrapers, points, borers and micro-burins along with flakes and cores made on chert (ninety-five per cent) and chalcedony (five per cent). Two circular huts with 3.80 m diameter were also encountered in this phase.

Phase II B (Early Mesolithic) is marked by the occurrence of geometric tools of smaller size when compared with the preceding phase. The tools made on chert (ninety per cent) and chalcedony (ten per cent) include parallel-sided blades, blunted backed blades, obliquely retouched blades, notched blades, lunates, points, scrapers, triangles and trapezes along with a large number of cores, blanks and chips. Among the geometric tools, the triangle appears earlier than the trapeze. Two circular houses on plan were exposed. One of the huts was having stone-paved flooring. Burnt clay lumps, a few with reed and bamboo impressions, fragments of animal bones, hammer-stones and anvils with batter marks and stone sling-balls were also recovered from this phase.

Phase III (Late Mesolithic) is marked by the appearance of handmade pottery consisting of ill-fired dull yellow, ochrous red ware (pl. XXV A). A few sherds bear incised decorations. As many as thirteen circular or oval huts, varying in diameter from 4.50 to 2.50 m, and a number of hearths were found in the excavation. The floors of these huts were littered with large number of microliths, stone pieces, hammer-stones, anvils of different sizes with pitted and battered surface and animal bones. The hearths (pl. XXIII B) yielded charcoal and animal bones. A few burnt clay lumps encountered in the excavation contain rice and rice-husk (pl. XXII B). The microliths were represented by blades (parallel-sided, blunted-backed, obliquely-blunted and notched), points, arrowheads (a few with incipient tangs), lunates, awls, triangles, trepezes and serrated blades made on chert, chalcedony, agate, carnelian, etc. Other finds obtained from this phase include anvils, mullers, hammers, sling balls, ring stones with hour-glass perforations and a few bone objects.

73. EXCAVATION AT MAHAGARA, DISTRICT ALLAHABAD.—In continuation of last year's work, Sarvashri D. Mandal, J. N. Pal and Kamlakar Thakur, under the general supervision of Professor G. R. Sharma, of the Department of Ancient History, Culture and Archaeology, University of Allahabad, resumed excavation at Mahagara.

The excavation revealed that the site belongs to the neolithic culture, represented by a 3.30-m thick deposit, divisible into six structural phases demarcated by floors and post-holes of huts and pits (pl. XXVI A). Altogether eighteen hutments belonging to the uppermost phase, in an excavated area of 166 sq m, were exposed. The floors of the huts, circular or oval on plan, vary from 6.70 X 6.25 m to 5.0 X 3.50 m, and are circumscribed by 6 to 9 post-holes. The walls of the huts were made of wattle-and-daub as evidenced by the occurrence of burnt clay lumps with impressions. The occupational debris overlying the floors yielded potsherds, household implements, bones of animals (pl. XXVII A and B), etc. An outstanding discovery, however, is that of a cattle-pen, measuring 12.5 7.5 m, demarcated by twenty-eight post-holes on the periphery. It is surrounded by huts and probably had its entrance on the west. Hoof-impressions of cattle (pl. XXVI B) were found inside the pen. Antiquities recovered from

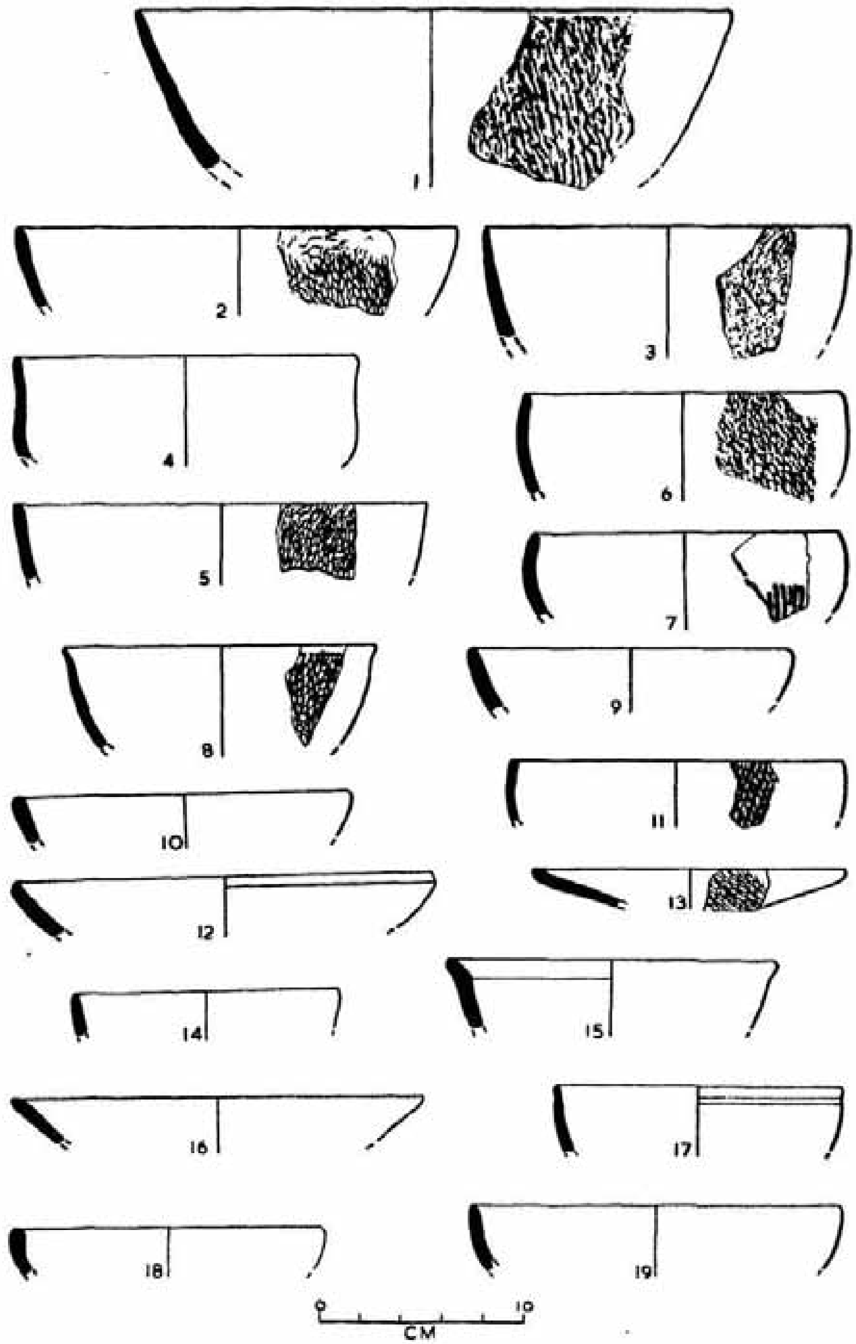


FIG. 8. *Mahagara : pottery types*

the pen include pottery, blades, polished stone axes (pl. XXVIII A), bone objects, animal bones and carbonized grain.

The pottery (pl. XXVII C) is handmade, coarse and ill-fired, and shows in its paste quartz particles, husk and even rice. It is represented by corded, rusticated and burnished wares (figs. 8-9), of which the corded ware accounts for nearly ninety per cent of the recovered pottery. The pot-forms include straight-sided, deep and shallow bowls with featureless rims, storage jars, vases, etc. The burnished ware is available both in red and black hues. The burnished red ware is represented by straight-sided deep and shallow bowls, jars, small vases, *handis* and spouted vessels, while the burnished black ware is represented by bowls only. Besides cord impression, some of the sherds also show thumb-nail impressions and criss-cross incisions.

The microlithic industry is represented by blades (parallel-sided, blunted backed, pen-knife), points, lunates, triangles, trapezes, scrapers and tranchets, fashioned on chalcedony, chert, agate, carnelian and quartz. Besides, a few long and broad chert flakes with unretouched margins, probably used as knives, were also found.

Polished stone axes with rectangular or oval cross-section, made on basalt and a few ring-stones with hour-glass perforations were also recovered from the site. Other important antiquities include saddle querns, mullers, sling balls, hammer-stones and grinding stones, arrowheads of bone, terracotta beads and perforated pottery discs. Skeletal remains of the animals, domesticated and wild, represent bovid, sheep, goat, pig, stag, deer, tortoise, fish and birds.

Excavation of the Cemented Gravel III deposit, exposed at the site, towards the bank of the river, revealed that this 1.0-m thick deposit contained eight bands of varying thickness, containing calcium, iron nodules, collovial fragments of quartzite, laterite crusts and nodules and sands of coarse grains. The deposit yielded fresh water shells, distributed from top to bottom, animal fossils and broad blades fashioned on chert. The nature of the deposit, thus, indicates that it is river borne and not a leaching of the calcium contents present in the underlying deposit, i.e. yellow silt.

74. EXCAVATION AT SRINGAVERPUR, DISTRICT ALLAHABAD.—The ancient mound at Sringraur (Sringaverpur), also known as Surya Bhita, situated 35 km upstream of Allahabad on the Ganga, was excavated under Professor B. B. Lai of the Indian Institute of Advanced Study, Simla and Shri K. V. Soundara Rajan of the Survey assisted by Sarvashri D. K. Sinha, B. Narasimhaiah, Lalchand Singh, M. S. Mani, S. K. Sharma, J. C De, I. M. Tikoo and A. K. Mishra of the Survey and Sarvashri Surya Kant Srivastava and R. N. Kaw of the Institute under the project called 'Archaeology of Ramayana Sites'. The site, traditionally associated with Rama who crossed the Ganga after banishment from Ayodhya, has yielded a four-fold sequence.

Period I *(circa* eighth century to sixth century B.C.) appears to have been a differential and sporadic occupation on the various parts of the habitation area. Its main ceramics were black-slipped ware, some thick red-coloured ware, black-and-red ware and a burnished grey ware. No Painted Grey Ware was noticeable, although, in the red ware were represented some shapes which are normally met with in the ceramics associated with the Painted Grey Ware at Hastinapur. It remains to be ascertained if the thick red ware could have had an independent and earlier horizon.

Period II *(circa* sixth century to middle of the third century B.C.) indicates the use of the Northern Black Polished Ware in full bloom right from the start. It also yielded occasional sherds of the Painted Grey Ware in the lowest levels and a fine grey ware, showing a mat surface on the interior and shining glossy surface (akin to the Northern Black Polished Ware technique) on the exterior.

Period III *(circa* middle of the third century B.C. to third century A.D.) belongs to the Kushana and Gupta times. There was a wide-spread disturbance of the site in the Gupta period,

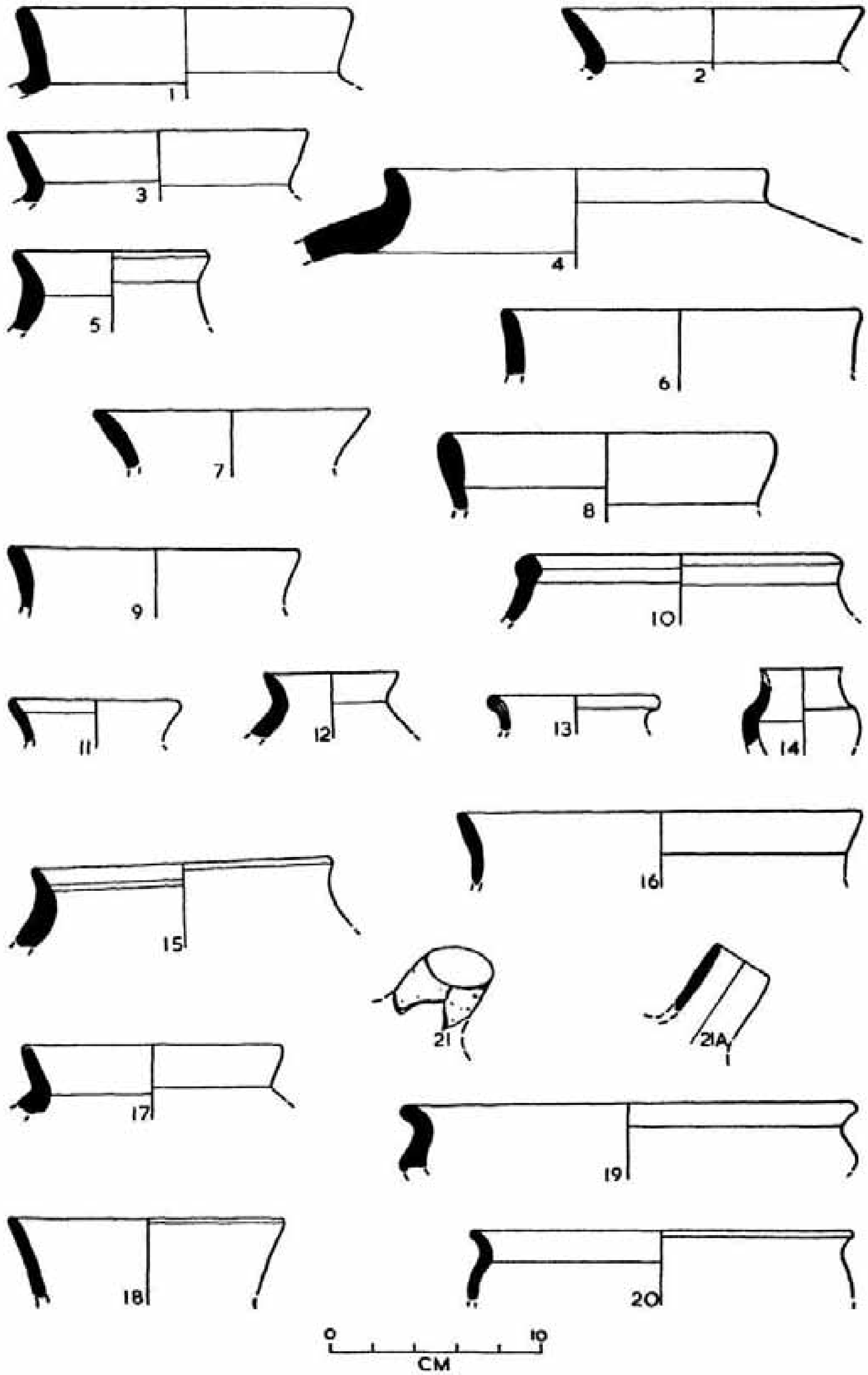


FIG. 9. *Mahagara : pottery types*

stratified levels being rare. However, a number of baked brick structures datable to Kushana times were encountered.

Period IV (sixth century to thirteenth century A.D.) is marked by the baked brick structures, pottery and antiquities belonging to the post-Gupta times.

The outstanding antiquities of the site, besides beads of various materials and terracotta objects obtained from the deposits of different Periods, were coins of the uninscribed cast and of the punch-marked variety, the latter in silver as well in copper, Lanky Bull type of Kausambi, Kushana coins such as those of Vima Kadphises and Ayodhya coins, besides a cache of thirteen Gahadavala silver coins (with some sundry jewellery in a small pot).

75. EXPLORATION IN DISTRICTS ALLAHABAD, MIRZAPUR, PRATAPGARH AND SULTANPUR.— Professor G. R. Sharma of the Institute of Archaeology, University of Allahabad, assisted by Sarvashri V. D. Misra, B. B. Misra, D. Mandal, J. N. Pal, R. Singh, B. G. Pandey, D. P. Sharma and D. S. Dubey, explored the Vindhyas and the central Ganga valley, with the view: (i) to locating the Stone Age sites in the region; and (ii) to confirming the geological formations observed earlier *(1975-76,* pp. 43-45) on the banks of the river Son and its tributaries in District Sidhi in Madhya Pradesh.

During the exploration in the Vindhyan area (District Mirzapur), a cliff-section of 20-m height was noticed on the left bank of the river Son at Chopan. The lower deposits of the Son, which were observed earlier, are not visible due to silting in the river-bed. But in a recent digging in the locality, a distinct horizon of red sand/silt was partly exposed. This forms the earliest visible unit at the site. It is weathered and its available thickness is 5 m. As in Sidhi, an almost identical deposit was noticed in several sections of the Son, resting on a boulder-conglomerate. Therefore, it may be presumed that at Chopan, too, the red sand/silt deposit overlies the boulder-conglomerate. The upper surface of the deposit is undulating, thus giving evidence of erosion before the accumulation of successive formation. On the top of this undulating sand/silt, occurs a distinctive deposit containing patches of cemented gravel and coarse-grained sand having a thickness of about 8 m. This gravel/sand deposit is overlain by a yellow silt of about 2 m thickness. This is succeeded by a blackish soil of 3 m deposit. In turn, the blackish soil is capped by a layer of 2 m of brownish soil.

Exploration in the valley of the Son and its tributaries in the area led to the discovery of more than six hundred fossil-bones representing species like *bos, elephus, gharialis,* etc., collected mostly from the eroded surface of cemented gravel/sand deposit at Patvadh and Rendia in the Son valley and Mahalpur (Nimidan-ka-nala) in the Rihand valley.

Besides, Lower Palaeolithic sites, yielding cores, flakes, handaxes, cleavers and scrapers, made on quartzite and chert, were noticed at Gothani in the Son valley and Khairahia in the Rihand valley.

Middle Palaeolithic sites, yielding cores, flakes, various types of scrapers, points and blades, made on quartzite, cherty flint, quartz and jasper, were noticed at Bakharaur, Bargama, Chhitakpurwa, Karamdan, Khakhan, Kurhul, Mitapur, Patvadh, Rendia and Sinduria in the Son valley, at Khairahia, Chunahia and Mahalpur in the Rihand valley. Sites at Karamdan and Patvadh yielded chopper-chopping tools also. Among the above sites, Bakharaur, Chunahia, Khairahia, Mahalpur and Patvadh are factory sites, yielding fresh and unrolled tools with edges not showing any sign of wear and tear. However, the tools collected at Khakhan and Kurhul are highly patinated.

Upper Palaeolithic sites were noticed at Agori Madaein, Alaur, Asnahwa-ki-Pahari near Chopan, Bakharaur, Chitwar, Ghoria, Gurdah, Khajurkhan, Khakhan, Kotta, Kurhul, Mitapur, Nevari, Patvadh, Rendia, Rijula and Semia, all in the Son valley and at Khairahia and Mahalpur in the Rihand valley. Tool repertoire includes blades (long, retouched and blunted-backed), points, borers, scrapers, burins and crescents, besides cores and Hakes, made

on flinty chert, quartz, jasper and chalcedony. Among the sites mentioned above, the sites at Bakharaur, Khairahia, Kotta, Mahalpur, Patvadh and Rijula are factory sites and the sites at Asnahwa-ki-Pahari and Kurhul yielded highly patinated tools.

Mesolithic sites were noticed at Ghoria, Newari, Semia and Sinduria, all in Son valley, yielding non-geometric microlithic tools including blades (parallel-sided and blunted backed), scrapers, points, crude lunates, cores and flakes, made on chert and chalcedony.

The site at Sinduria in the Son valley yielded one fragmentary ground and polished celt and a muller while another broken neolithic celt was picked up from Mahalpur in the Rihand valley.

Khajurkhan on the left bank of the river Son, 8 km north-west of Chopan, yielded Kotia-type of megalithic pottery and fragmentary glass bangles.

Exploration in the central Ganga valley comprising parts of Districts Allahabad, Pratapgarh and Sultanpur, covering an area of about 1036 sq km, revealed the following sites. Sites at Aheri (District Allahabad), Mandah, Shalhipur and Suleman-Parbatpur (all in District Pratapgarh) yielded Epipalaeolithic (late Upper Palaeolithic) tools, comprising large-sized blades, blunted backed blades, scrapers, points, burins, lunates, cores and waste flakes. The tools are made on chert and show bold retouch. From their stratigraphy and types they appear to be earlier than the Mesolithic tools.

Altogether eighty-nine sites belonging to the Mesolithic period, yielding microliths including blades, blunted backed blades, points, lunates and scrapers made on chert, chalcedony, agate, carnelian and quartz, were noticed. Of these, the sites at Garain, Garapur, Hathauratal (District Pratapgarh) are important. Besides, the sites at Bhewani, Dharmanpur, Jetapur and Utras yielded geometric types such as triangles and trapezes. Most of the sites are situated either on the bank of some horse-shoe lakes or on the bank of tributary nullahs of the Sai. All these sites are situated over alkaline area, thus confirming the earlier observations in Sarai Nahar Rai area.

As many as twenty-six chalcolithic sites were also discovered in District Pratapgarh. Among prominent sites, mention may be made of Bhanti, Kanjasarai Gulami, Maraha, Pelkhawar, Pure Deojani, Sarai Jamuri and Tibbipur. These sites yielded black-slipped, red and grey wares (pl. XXV B). Some of the sherds of the black-slipped ware show paintings in vertical or straight lines in white both on the outside and the inside. Blades manufactured by crested-ridge technique are conspicuous by their presence in this industry.

The exploration also brought to light about thirteen sites belonging to early historical period at Asudhi, Bardih, Belkhanath, Handaur, Kopa, Rasulaha and Soron. The site at Soron yielded Northern Black Polished Ware and punch-marked coin whereas the site at Handaur yielded Northern Black Polished Ware besides early historical remains.

76. EXPLORATION IN DISTRICT ALMORA.—In the course of exploration, Dr Arun Kumar and Sarvashri S. K. Lekhwani and Pramod Singh of the Northern Circle of the Survey, noticed a *naula* (water spring) at Syunarkot, built of fine dressed stones, almost a replica of Katyuri shrine which is fronted by a pillared porch attached to the central aisle. The niches in the porch, *garbhagriha* and exterior walls are embellished with delicately carved images of Krishna playing on flute, Surya, Sarasvati and other celestial beings.

77. EXPLORATION IN DISTRICT KANPUR.—In the course of exploration, Dr Arun Kumar and Shri L. M. Wahal of the Northern Circle of the Survey, noticed an ancient mound on the southern bank of the river Ganga near Nawabganj locality in the town limits of Kanpur. The site yielded Painted Grey and Northern Black Polished Wares besides pottery of Sunga-Kushana times. A few sherds of black-and-red ware were also collected from the site.

78. EXPLORATION IN DISTRICT MAINPURI.—In the course of exploration, Shri L. M. Wahal of the Northern Circle of the Survey, discovered ancient sites at Aronj, Arsara, Behsi, Bhagner, Eka, Itoura, Khariad, Kisraom, Mehrabad, Nagla Havelia, Nagla Khas Gloura, Praonkh, Pundri, Sahan, Sarai Bharthara and Sherpur Qutbpur, yielding Painted Grey Ware (except Praonkh and Sahan), besides associated fine grey ware, Northern Black Polished Ware, black-slipped, red wares, Sunga-Kushana pottery and a few sherds of glazed ware. However, the site at Eka and Nagla Havelia yielded a few sherds of black-and-red ware. Terracotta figurines, datable to Sunga-Kushana times were collected from the sites at Arsara, Khariad, Kisraom and Nagla Khas Gloura, and terracottas of Gupta times from Kisraom. Besides, two copper coins of Kshatrapa king Hagamasa and Kushana king from Arsara, one coin of Kshatrapa king, a copper coin of Agnimitra and Muslim coin were also recovered from Behsi.

79. EXPLORATION IN DISTRICT MIRZAPUR.—In the course of exploration, conducted by the Department of Archaeology, Government of Uttar Pradesh, under the direction of Shri R. C. Singh assisted by Sarvashri Hem Raj and R. K. Chaturvedi, many painted rock-shelters and ancient sites were discovered.

The rock-shelters noticed at Jafarabad, Pathraura and Sherwan bear paintings executed in ochre colour, showing warriors fighting with bows and arrows, holding double edged swords and scabbards besides hunting scenes. The animals painted include stylistic horses, birds and fish. Some of the animals are shown as struck with arrows and harpoons.

The sites yielding Northern Black Polished Ware were noticed at Chainpurwa, Puraini and Tendus. The sites at Barambaba, Bhormal, Jagwa, Jalalpur and Pakadi, yielded medieval potterv.

Early medieval temples were noticed at Galauri, Gauri, Gharwaha, Kaiya, Keshipur, Pairora, Sahajani-Hardi and Teraria-Kala.

80. EXCAVATION AT MAHADAHA, DISTRICT PRATAPGARH.—Sarvashri V. D. Misra, D. Mandal and J. N. Pal, under the general supervision of Professor G. R. Sharma of the Department of Ancient History, Culture and Archaeology, University of Allahabad, conducted excavation at Mahadaha, 89 km north north-west of Allahabad, where a few skeletons probably belonging to the Mesolithic period were encountered while widening the Jaunpur Monor of Sharda Sahayak Canal, on the bank of an ancient dried up horse-shoe lake. The main objective of the excavation was to ascertain the nature of the cemetery and of the habitational and lake deposits.

Excavation on the right bank of the old canal revealed fifteen graves with shallow oblong pits, discernable into four phases (pl. XXIX A). These Mesolithic graves contained extended articulated skeletons, oriented east-west, with head invariably towards west and face turned towards north. The hands of the buried individuals, except in one case, were extended along the body. Two double-burials with skeletons of opposite sex, female placed over the male (pl. XXIX B) in one case and the female placed by the side of the male towards north in the other were encountered. Among the skeletons, one of them was found to wear a necklace and pendant while another was found wearing a necklace, both of bone. These two skeletons belonged to males. Of the seventeen skeletons recovered, the sex of thirteen could be determined; eight being male and five female. Average height of the male was 1 .92 m while that of female 1.78 m. The age of the individuals ranged from seventeen to thirty-five years, the majority of of them being of younger age-group. Other important finds recovered from the graves include: microliths; bone ornaments and arrowheads; and animal bones.

Excavation in the area, east of the above site and on the periphery of the lake yielded plenty of animal bones, especially of stag (pl. XXIV B). A good number of bones show cut

marks, indicating that the area was used for butchering. Bone tools and other objects in various stages of manufacture were also encountered in the excavation (pi. XXVIII B).

The excavation in dried up lake, to a depth of 2-90 m, revealed ten layers of deposition, of which layers 9 and 8 yielded remains of the Mesolithic period. They include animal bones, microliths, bone arrowheads, querns, mullers and burnt clay lumps. Animals represented include *bos, bos bubalus, elephus, hippopotamus,* rhinoceros, stag, pig, turtle, fish and birds.

81. EXPLORATION IN DISTRICT SITAPUR.—In the course of exploration, Shri R. K. Chaturvedi of the Department of Archaeology, Government of Uttar Pradesh, discovered the following sites.

(PGW=PAINTED GREY WARE; NBP=NORTHERN BLACK POLISHED WARE; BW=BLACK WARE; RW = RED WARE; EH=EARLY HISTORICAL; M=MEDIEVAL; MT=MEDIEVAL TEMPLE; MS = MEDIEVAL SCULPTURES; CC = COPPER COIN)

District	*Village/Site*	*Cultural assemblage*
Sitapur	Alampur	EH, M, MS, CC
-do-	Badaila	EH, M
-do-	Bamhera	EH, M, MS, CC
-do-	Bhadurpur	MT
-do-	Bhanpur	MT
-do-	Bhitaura	EH, M, CC
-do-	Bibipur	EH, M
-do-	Bitholi	MT
-do-	Goma	MS
-do-	Gopalpur	MT
-do-	Jagdishpur	EH, M
-do-	Jagjivanpur	EH, M, CC
-do-	Jairampur	MT
-do-	Jyotipur	EH, M
-do-	Jyotishah	EH, M
-do-	Kabra	EH, M
-do-	Paharpur	EH, M, CC
-do-	Pirnagar	MS
-do-	Ramgarh	PGW, NBP, BW, RW
-do-	Ramkot	EH, M, MT, MS
-do-	Rampur	EH, M
-do-	Rudha	EH, M, CC
-do-	Salimpur	EH, M
-do-	Sujilia	MT
-do-	Tehri	EH,M

WEST BENGAL

82. EXPLORATION IN DISTRICT MIDNAPORE.—Shri P. C. Das Gupta of the Department of Archaeology, Government of West Bengal, discovered on the left bank of the river Kangsavati at Sijua near Ramgarh, 30 km north-west of Midnapore, a fossilised mandible of a man in the yellowish sand deposit overlying the gravel layer and 12-20 m below the top surface of the highest terrace, which is 15.24 m high from the present river bed. This specimen has been identified by Shri M. V. A. Shastri of the Palaeontology and Stratigraphy Division, Geological Survey of India, as that of *Homo sapiens sapiens,* belonging to the early Holocene.

II. EPIGRAPHY

SANSKRITIC AND DRAVIDIC INSCRIPTIONS[1]

ANDHRA PRADESH

1. WESTERN CHALUKYAN INSCRIPTION, KONAKONDLA, DISTRICT ANANTAPUR.—The inscription of the Western Chalukyan king Tribhuvanamalla Vikramaditya VI, dated A.D. 1082, records the construction of a Jaina *Basati,* by the king's subordinate, in Chitta Jinalaya at Kondakunda and endowed it with gift of land for *dipa, naivedya,* etc., of the deity.

2. VIJAYANAGARA COPPER-PLATE INSCRIPTION, KONDAGATTUPALLI, DISTRICT ANANTAPUR. ----- The copper-plate grant, dated Saka 1282, records the gift of the village Patnam to one Ramireddy by the Vijayanagara king Sri-Virapratapa Sri-Harihararaya.

3. VIJAYANAGARA COPPER-PLATE INSCRIPTION, MUTHUKUR, DISTRICT ANANTAPUR.—It records the grant of the villages of Sivaram and Muthukur to certain Devunigauda who accompanied *perinayaka* for the construction of a fort.

4. WESTERN CHALUKYAN INSCRIPTION, PEDDACHAPPALI, DISTRICT CUDDAPAH.—Dated in the ninth regnal year, corresponding to Nandana, of the Western Chalukyan king Somesvara III, the inscription refers to one of his subordinate Mallideva Maharaja, bearing the title *Trailokyamalla,* ruling from the latter's capital Vallur. One *yuvaraja* Ahavamalladeva made a gift to the Saiva-matha of the Pasupatha sect.

5. PILLAR-INSCRIPTION, DRAKSHARAMA, DISTRICT EAST GODAVARI.—Engraved on a pillar in the *Uyyala-mandapa* in the Bhimesvarasvami temple, the inscription, in Telugu language and characters, is dated Saka 1219 (A.D. 1297) and records the consecration of the image of Durga to the north-west of the Bhimesvarasvami temple by Gosu Lachchisetti and his wife for their perpetual merit.

6. COPPER-PLATE GRANT, JANGAREDDIGUDEM, DISTRICT EAST GODAVARI.—Dated in Saka 1345 (A.D. 1423), the inscription refers to Vemamba, wife of Allaya Vema, son of Podda, of the time of the Reddi kings of Kondavidu.

7. PILLAR-INSCRIPTION, MUKTISVARAM, DISTRICT EAST GODAVARI.—An inscription found engraved on one of the pillars of the *mukha-mandapa* in the Muktisvarasvami temple is in Telugu language and characters of the thirteenth century. It refers to the chief *maha-mandalesvara* Pasumadti Polayadeva-maharajulu who is stated to have made a gift of land in Kadalapalli as *sarvamanya* to the temple and entrusted the same to the seventy-two *niyogas.*

8. BUDDHIST INSCRIPTION FROM GUMMADIDURRU, ARCHAEOLOGICAL MUSEUM, AMARAVATI, DISTRICT GUNTUR.—This Prakrit inscription of the second century A.D. engraved on a lintel

[1]Information from: 1 to 4, 6, 9-13 and 13-16 Director, Archaeology and Museums, Andhra Pradesh; 38, Deccan College Post-graduate and Research Institute. Pane: 49. Shri M. X. Katti of the Southern Circle of the Survey; and the rest from the Chief Epigraphist of the Survey, Mysore. Information on 31 also received from Department of Archaeology and Museums, Government of Karnataka.

brought from Gummadidurru, and now in the Archaeological Museum, Amaravati, records that (this) rail *(veti),* three cubits long, is the gift of Sidhathaya, the female pupil of Purima (Purva)-Mahavina-seliya.

9. INSCRIPTION OF REDDY DYNASTY, KONDAPALLI FORT, DISTRICT KRISHNA.—The inscrip tion from_ Kondapalli fort, near Vijayawada, refers to *Karpura Vasantaraya* as the title of Komaragiri Reddy of the Reddy dynasty of Kondavidu. The title so long known from literary sources occurs here perhaps for the first time in an epigraph.

10. EASTERN CHALUKYAN COPPER-PLATES, VIJAYAWADA, DISTRICT KRISHNA.—A set of four plates found at Kadali in East Godavari are now preserved in the Victoria Jubilee Museum, Vijayawada. It is in Sanskrit language and engraved in southern characters of about the tenth century A.D. It belongs to the reign of Amma II, also called Rajamahendra, and quotes his well-known date of coronation (Saka 867= A.D. 945, December 5). The inscription records the royal grant of the village Siriyuru converted into a tax-free *agrahara* on the day of *uttarayana* to a brahmana Dariya-bhatt, for the merit of his parents (cf. *Bharati,* XLII, pp. 23-37).

11. VIJAYANAGARA COPPER-PLATE, CHERUVUBELGOLA, DISTRICT KURNOOL.—Dated Saka 1413, the copper-plate belongs to the reign of Saluva Narasimha.

12. KAKATIYA INSCRIPTION, DISTRICT NALGONDA.—An epigraph dated Saka 1175 (A.D. 1253) while mentioning the name of the Kayastha chief Gangayasahini, mentions his father Sri Dhanava and grandfather Sri Dhasuva who were not known previously. The location of this inscription confirms the statement made in other records of Gangayasahini that his territory extended from Panugallu (in District Nalgonda) to Marjavadi (in District Cuddapah). The Kayasthas served as subordinate chief under the Kakatiyas.

13. VIJAYANAGARA COPPER-PLATE, KAVALI, DISTRICT NELLORE.—Belonging to the time of Harihara II the record, dated Saka 1298, mentions the renowned commentator Sayanacharya, brother of Madhava, the minister of Harihara II.

14. BUDDHIST INSCRIPTION, DUPADU, DISTRICT PRAKASAM.—Engraved on a sculptured slab, with representation of stupa, lying on a mound near the Nagarjuna Sagar canal, this Prakrit inscription of about the third century A.D. seems to record a gift by a *sramanaka* along with his wife.

15. WESTERN CHALUKYAN INSCRIPTION, APPIKONDA, DISTRICT VISHAKHAPATNAM.—The inscription belongs to Somesvara III and its provenance shows that the Karnataka king penetrated deep into the coastal region through Vengi.

16. LATE MEDIEVAL INSCRIPTION, LAKSHMIDEVIPETA, DISTRICT VISHAKHAPATNAM.— It belongs to one Akkadeva Raja of the fifteenth century and bears the emblem of *matsya* or fish.

17. EARLY INSCRIPTIONS, GUNTUPALLE, DISTRICT WEST GODAVARI.—There are two inscriptions in Prakrit language and Brahmi characters of the first-second century A.D. Both are engraved on limestone pillars found in the monastery area at the stupa-site near the caves. The first one records that this *jasakhambha (jayakhamba* i.e. 'the pillar of victory') in the Inammi *maha-sela-mandava (maha-sila-mandapa* of lnamm) is a pious gift in favour of the Ariya-samgha *(Arya-samgha)* of the Mahanagapavata by Budha, a lay-worshipper *(upasika)* and the wife of the householder Hamgha of Sa[ku]le. The other one records that the pillar in the *stone-mandapa*

on the Mahanagapavata along with a cave *(sa-ghara)* is a pious gift of Nataga, son of the householder Uttaraba Gagna, the son of a servant-cook *(cheta-pachaka)* and the lady Duhusa (cf. *Bharati,* LV, pp. 26-27).

18. SALANKAYANA INSCRIPTION, GUNTUPALLE, DISTRICT WEST GODAVARI.—Engraved on a rectangular limestone pillar below the Prakrit inscription mentioned above, this damaged inscription in Sanskrit language and southern characters of about the fifth century A.D. gives the genealogy of the king starting with Hastivarmma. It belongs to the reign of Vijaya Nandivarmma (II) and seems to refer to a *vihara* and grant of land.

GUJARAT

19. RATHODA INSCRIPTION, BADOLA, DISTRICT SABAR KANTHA.—Engraved on a white stone fixed into the left side wall of the *vav* (step-well), this inscription, in Nagari characters and Sanskrit language, is dated Vikrama 1682 (A.D. 1625-26). It refers to the reign of the Rathoda king Kalyanamalla and records the construction of the entrance to the well by Rana Samga who hailed from the Vaghela stock and was the maternal uncle of the ruler.

20. STONE INSCRIPTION, SABLI, DISTRICT SABAR KANTHA.—-This inscription, in Gujarati and Sanskrit languages and Nagari script, is engraved on a marble slab fixed into the western wall of the village *kunda.* Dated Vikrama 1599 (A.D. 1543), it records the construction of a tank for public utility by *Bat* Kauri, sister of Jivani, the queen *(maharani),* in the reign of *maharajadhiraja* Bharamalla, who is described as belonging to the line of Bhanu-bhupala and as the son of Bhimabhupa.

21. GUJARATI INSCRIPTION, SABALWAD, DISTRICT SABAR KANTHA.—Dated Vikrama 1599 (A.D. 1543) and referring to the reign of Bharamalla, this inscription in Gujarati and Sanskrit languages and Nagari characters, engraved on a stone fixed into the left wall of the step-well, records the construction of a step-well for public utility by *Mata Bai* Dhyarani, the sister of Jivani, the queen *(maharani).*

KARNATAKA

22. KANNADA INSCRIPTION, BAGGURU, DISTRICT BELLARY.—This Kannada inscription, of the tenth-eleventh century, engraved on a stone in a field, belongs to the reign of the king Vijayadityadeva ruling from Kisuvolai. It records that the village Bagguvura was given as an *agrahara* to Bannamayya.

23. PILLAR INSCRIPTION, BALKUNDE, DISTRICT BELLARY.—This inscription in Sanskrit verse and Kanada prose, and in Kannada characters, is engraved on a circular pillar at the entrance into the village. It records the construction of a *basadi* and the installation of a stone Jaina image at Ballakunda-tirtha by Sridhararyya, son of Machinaryya of Kausika *gotra* and a *niyogi* of Nolambadhiraja and grant of land entrusted to the merchants of Ballakunda-na^«m to provide for the worship on the day of *Uttarayana-sankranti* in the year Kalaka of the Saka year 930 (A.D. 1008).

24. VIJAYANAGARA INSCRIPTION, GUNDIGANUR, DISTRICT BELLARY.—Belonging to the reign of Sadasivaraya this Kannada inscription is engraved on a stone near the Katte-Basava shrine and records a grant of the village Gundaganuru in the *sima* of Kurugodu to Lakshmikanta-dikshita as *ekabhoga-agrahara* to provide for food-offerings to the god Virupaksha by Pratapa-Devaraya. Dated in Saka 1465, Sobhakrit (A.D. 1543), the inscription states that on the extinction

of the family of Lakshmikanta-dikshita the village reverted to the government, and after some time Ramaraja-ayya made a request on behalf of the *sthanikas* to Sadasivaraya-maharaja for the grant of the same village, half of which was granted to provide for food-offerings to the god Hampe Virupaksha, on the *Kapila-shashthi-punykala* for the merit of his father Achyutaraya.

25. TWO CHALUKYAN INSCRIPTIONS, HATCHOLLI, DISTRICT BELLARY.—One of the two Kannada inscriptions belongs to the reign of Trailokyamalladeva and is dated in Saka 966, Tarana (A.D. 1044). It records a gift of land at Kirudore to Trailokyamalla-Jiyar by the king who is stated to be seated on a high platform in the *dehara* at *poravidu,* west *of nelevidu.* The other one dated in Chalukya Vikrama year 37, Nandana (A.D. 1112), records a grant of land, in the reign of Tribhuvanamalla, to provide for food-offerings to the deity Mulasthanadeva at Piriya-Bellahara by Patta-mahadevi, the queen of Tribhuvanamalla.

26. TWO CHALUKYAN INSCRIPTIONS, KONCHIGERE, DISTRICT BELLARY.—Of the two Kannada inscriptions, the one belonging to the reign of Tribhuvanamalla, is dated in Chalukya Vikrama year 45, Sarvari (A.D. 1121) and records a grant of land in Kuchamagere in Ballakunde-Three hundred to *Devarasi-pandita,* for the daily worship, etc. of Svayambhu-Kalideva by *maha-mandalesvara* Sovidevarasa of the Sinda family. Engraved on the same slab the other record refers to the rule of Sarvajna-Chakravarti Bhulokamalla. Dated in his l(3)th regnal year, Pingala (A.D. 1138), it seems to record a grant by *mahamandalesvara* Rachamallara [sa] of Phani-kula.

27. MINOR ROCK-EDICT OF ASOKA, NITTUR, DISTRICT BELLARY.—This minor rock-edict of Asoka inscribed on two boulders of pink granite is engraved in Prakrit language and Brahmi characters of the Asokan period. Significantly, Asoka's name is mentioned at the end part of the edict on the first boulder and also at the beginning of the next part on the second (pl. XXX A).

28. VIJAYANAGARA INSCRIPTION, NITTUR, DISTRIGT BELLARY.—A Kannada inscription in twenty-five lines engraved on a granite pillar near the Hanuman temple belongs to the reign of Virapratapa Sri Sadasivaraya (A.D. 1543). It records the grant of Nitturu *agrahara* on the banks of the Tungabhadra to the Vittala temple for the well-being of Achyuta Raya in heaven.

29. TRILINGUAL INSCRIPTION, SIRUGUPPA, DISTRICT BELLARY.—Written in three languages—Persian, Marathi and Kannada, and in three scripts-Nasta' liq, Nagari-Modi and Kannada—it is dated Saka 1571 Virodhi (A.D. 1649) and records the fixing of a gate and the construction of a *burj* (tower) called Saheba-burj on the banks of a river by Rudro-Lingoji during the administration of Abadul Vahaba Saheba Amada Phala Ayana Malika Allisana-Sadata, the *mokhasayi* of Siruguppe.

30. KANNADA INSCRIPTION, TEKKALAKOTE, DISTRICT BELLARY.—Dated in Saka 943, Raudri (A.D. 1021), this Kannada inscription, found on a boulder in a field refers to *Mahaprachanda-dandanayakaBrahmadhimia* and the stipulation of levies annually on agricultural produce from the village Papekallu.

31. MINOR ROCK-EDICT OF ASOKA, UDEGOLAM, DISTRICT BELLARY.—Engraved on a granite outcrop this minor rock-edict of Asoka also mentions the name of Asoka *(Raja Asoko)* followed by *Devanampiya.* Its purport is almost similar to the edict of Asoka found at Nittur. One half of the edict up to the date portion is on one boulder while the rest occurs on another (pl. XXX B and C).

32. CHALUKYAN INSCRIPTION, BODAN, DISTRICT GULBARGA.—This Kannada inscription on a slab in front of the Mallikarjjuna temple belongs to the fifth regnal year (A.D. 1142) of Jagadekamalla (Jagadekamalla II). It refers to the installation of gods Mallikarjjuna and Kesavadeva on both sides of Mulasthanadeva by Naranadandadhisa the *prabhu* of Piriya-Bodana, which was situated in Naravani-12, a *kampana* of Gomka-120, being the subdivision of Alande 1000. The last-mentioned division is said to be *a jivita* of Santeya-nayaka, the *talara* of Sarasvatipura, a town founded by Malayavatidevi and administered by Bammanayya-dandanayaka.

33. WESTERN GANGA INSCRIPTION, HUNASIKOTE, DISTRICT KOLAR.—The inscription, in Kannada language and characters of about the ninth century A.D. on a slab lying in the Venugopalasvami temple is dated in the reign of Rachamalla Perammandi and seems to record that Nijaramarasa, son of Nolambadi-arasa conferred the title of *Nijarama-gamunda* on Mandali, son of Aremuran, who reconstructed the tank of Do[mme]uru when it breached along with perquisites like a big drum *(piri-pare)* and land.

MADHYA PRADESH

34. COPPER-PLATE GRANT OF MAHASIVAGUPTA, MALHAR, DISTRICT BILASPUR.—A set of three copper plates discovered from a tank belongs to the reign of *Parama-mahesvara* Mahasiva-guptaraja of the Panduvamsi. Written in Sanskrit, in the box-headed characters of the sixth-seventh century A.D., it records the grant of the village Sushkasirillika situated on Oni-bhoga to the brahmana Sivanandin belonging to Kosala-nagara for attending to the repairs to the temple of Kapalesvara and for *ball* and *charu.*

35. STRAY KALACHURI COPPER-PLATE CHARTER, MANDLA, DISTRICT MANDLA.—Engraved in Sanskrit language and Nagari characters on the second plate of a set of two, the first one being lost, it was discovered at Jhulpur, District Mandla, and now preserved in the District Archaeological Museum, Mandla. It belongs to the reign of Vijayasimha of the Kalachuri branch of Ratanpur and is dated in the Kalachuri year 949, Margasirsha ba.6, Sunday (A.D. 1198). It registers the royal grant of the village Matima situated in Jauli-pattala by the king to Vidyadhara-sarma on the occasion of the *jatakarma* of *mahakumara* Trailokyavarman for his own merit as well as that of his parents. The donee is described as the great grandson of Pandita Bhuvana-sarman belonging to Vajasaneya-sakha and Bhargava-go/ra.

36. COPPER-PLATE GRANT OF MAHASUDEVARAJA, RAIPUR, DISTRICT RAIPUR.—Written in Sanskrit language and box-headed characters of the sixth-seventh century A.D., the charter belongs to the reign of Mahasudevaraja. Issued from Sripura, it is dated in his third regnal year, Karttika 30 and records the royal grant of the village Khalapadraka situated in Dakaribhoga to Madhava-chaturvedasvamin of Kasyapa-*gotra* for the king's own merit and for the merit of his parents. The charter was engraved by Golasingha.

37. TWO KALACHURI COPPER-PLATE CHARTERS, RAIPUR, DISTRICT RAIPUR.—These two charters, engraved in Sanskrit language and Nagari characters on two sets of copper-plates each, were originally found in a field at Pasid near Batapura and now preserved in the Mohant Ghasidas Memorial Museum, Raipur. One of them is dated in the Kalachuri year 893, Karttika su. 8, Thursday (A.D. 1142) and belongs to the reign of Prithivideva II. It records the grant of the village Durga, situated in Samantapatti, to a brahmana by name Parasara, son of Mahadhana belonging to Bharadvaja *gotra.* The charter was written by Vara son of Kirtti and the chief of *Jamder a-grama.* The second set belongs to the reign of Ratnadeva III

and is dated in the Kalachuri year 934 (A.D. 1183). It records the royal grant of a village to a brahmana.

MAHARASHTRA

38. NEW INSCRIPTIONS FROM KANHERI, DISTRICT BOMBAY.—Seventeen epitaphs giving the names of teachers along with their high qualifications were discovered by Dr Shobhana Gokhale. Palaeographically they range in dates from *circa* A.D. 600-700.

39. THREE CHALUKYAN INSCRIPTIONS, NARANGWADI, DISTRICT OSMANABAD.—Of the three Kannada inscriptions the first one engraved on a slab in the Bhojalinga temple dated in the fourth regnal year (A.D. 1129) of Bhulokamalla (Somesvara III) who was ruling from the capital of Kalyanapura, records the grant of land and money for the purpose of worship, offerings, etc., to god Bhogesvaradeva by *mahasamanta* Bocharasa at the orders of *mahamandalesvara* Mamgarasa. Belonging to the fifth regnal year (A.D. 1130) of the same king, the second epigraph, written on a slab standing in front of the Hanuman temple, records the grant of income to god Bhogesvaradeva of Nagara-Kavadike. The third one engraved on a slab in the Bhojalinga temple and dated in the second regnal year (A.D. 1139) of Jagadekamalla (Jagadekamalla II) records the grant of land for the purpose of worship and offerings to god Bhogesvara and houses to Amritarasi-jiya who was the recipient of the above gift, by *mahasamanta* Bocharasa at the orders of *mahamandalesvara* Mamgarasa.

40. TRAIKUTAKA CHARTER, PUNE, DISTRICT PUNE.—Consisting of a set of two copper plates, this charter, written in Sanskrit was originally found at Matvan, District Ratnagiri, and now preserved in the Deccan College Post-graduate and Research Institute. It is dated in the [Kalachuri] year 256, Karttika ba. 14 (A.D. 505) and belongs to the reign of the Traikutaka ruler *maharaja* Maddhyamasena.

RAJASTHAN

41. STONE-INSCRIPTION, DESURI, DISTRICT JODHPUR.—Though the inscribed stone slab is originally from Desuri, it is now kept in the Rajputana Museum, Ajmer. Written in Sanskrit, it records the construction of a well by Manikade, wife of *Raula* Karmasimha, the son of Dumgarasimha and grandson of Bhachumda of Gahilata *(Guhilot)-vamsa* on the first date, viz., Vikrama 1453, Saka 1318 (A.D. 1396). The same well was again renovated by Raja Vikaka on the second date viz., Vikrama 1520, Saka 1386 (A.D. 1464). Sutradhara Gigaka was the engraver of the record.

TAMIL NADU

42. STONE-INSCRIPTION, ALATTUR, DISTRICT COIMBATORE.—This Tamil inscription on a stone set up in front of a potter's house and engraved in Vatteluttu characters of about the ninth century refers to Vanavan-madeviyar, the consort of Sindaraiya-vellar and to the rule of Alattur by a person (name and other details lost).

43. TEMPLE-INSCRIPTION, ARASAMPALAIYAM, DISTRICT COIMBATORE.—Written in characters of the twelfth century A.D., this Tamil inscription is engraved on a door-jamb of the entrance into the *mandapa* of the Siva temple. Dated in the ninth regnal year of Kulottungasola of Kongu, it records the construction of the *mandapa* for Palvennisuram-udaiyar by Kuttan Kuttan *alias* Adiyaman belonging to the group of Kavalan Kurumbillar residing at Pattali.

44. VARADARAJAPERUMAL TEMPLE-INSCRIPTION, SAMALAPURAM, DISTRICT COIMBATORE.— Inscribed on a slab set up in front of the temple, the inscription in the Tamil characters of the fourteenth century, is dated in the cyclic year Angirasa during the reign of Vira-dannayakar. It records the assignment of income from taxes on several merchandise by the merchant-guild Padinen-Vishayattar of the four quarters who are stated to be in charge of exports *(erusattu)* and imports *(irangu-sattu)* to god Arulalanatha.

45. TWO HERO-STONE INSCRIPTIONS, CHELLAMPATTI, DISTRICT DHARMAPURI.—One of the two inscriptions engraved in Tamil characters and dated Saka 820 (A.D. 898) refers to the rule of Ganga Rachaman and records the death of Chuli Puliyan after killing a tiger. Also, it refers to the rule of Malaikunru by Kudal Manikkan, a servant of Mavalivanarayar of Tagadur. The other, also in Tamil, is dated Saka 822 (A.D. 900) and refers to the rule of Aiyappadevan and records the death of Kudal Manikkan on behalf of Sivamaraiyyan when Pirudipati, son of Ganga Rachaman and Sivamaraiyyan, son of Nulamban attacked Malaikunru fcf. *Dharumapuri Kalvettugal,* I, pp. 49-50).

46. HERO-STONE INSCRIPTION, GARIGEPALLI, DISTRICT DHARMAPURI.—This fragmentary hero-stone inscription in Tamil engraved in Vatteluttu characters of the eighth century is dated in the reign of Kattinaiparumar. It refers to Kovur-nadu and Perumbana.

47. ROCK-INSCRIPTION, NAYAKKANUR, DISTRICT DHARMAPURI.—Engraved on a face of the rock near an old oil-mill this Tamil inscription of the tenth century A.D. records the setting up of the oil-mill *(chekku)* and the excavation of a lake by Kirandai Pavittiran Kalaganan of Chirridaiyarrur in Kovur-nadu.

48. GANGA INSCRIPTION, PALAVADI, DISTRICT DHARMAPURI.—Written in Vatteluttu characters of the eighth century on a hero-stone, this Tamil inscription is dated in the tenth regnal year of Sripurusha and records the death of Nochchi Sattanar in a cattle raid while Perumbanaputtaraisar was ruling Ganga-nadu.

49. HERO-STONE INSCRIPTION, MADRAS (KALAKSHETRA), DISTRICT MADRAS.—The inscription in Kannada script and language assignable to the early tenth century A.D. (pl. XXXI A) records that (Chatti) yara son of Sa[nda]ya setti died in course of a cattle raid at Poriyangadu belonging to Kannadam (balli). The hero is described as *palrode ganda* (leader of many persons).

50. INSCRIBED BOUNDARY STONE, MADURAI, DISTRICT MADURAI.—Originally found from Kulasekharapuram in District Ramanathapuram, this Tamil inscription, engraved in Vatteluttu characters of the eighth century A.D., is now preserved in the Tirumalai Naik Mahal, Madurai. It states that the stone (on which it is engraved) was set up to mark the boundary of a locality in Vada-Irukkai of the Pappar-Sanrar in Manarkudi.

51. PANDYA INSCRIPTION, MADURAI, DISTRICT MADURAI.—Preserved in the Tirumalai Naik Mahal, Madurai, this stone-inscription is dated in the (9 + 3) twelfth regnal year of Kulasekhara and records a tax-free grant of lands by the Nattar to god Tiruvagattisvararm-udaiyar-nayanar at Poyyil.

52. VIJAYANAGARA INSCRIPTIONS, AGARAM, DISTRICT NORTH ARCOT.—This Tamil inscription dated Saka 1391 (A.D. 1469) in the reign of the king Mallikarjunarmaharayar refers to the dedication of bonded labour in a group *(kottu-adimai)* of a Kaikkola family of thirteen

members of Agaram who sold themselves to the temple of Perumal Anaikatta-Appan for a sum of 2380 *panam* paid in an auction by the *Samaya-kumarar* Vanniya Timmaya-nayakkar, the *srikarayam* of the temple with the stipulation that the male members will do the duties of watch and ward of the deity *(tirumeni-kaval)* etc., and the female members will perform dance and song. Similar transaction, referred to in another inscription from the same place, took place in Saka 1393 (A.D. 1472) during the governorship of Rajasekhara-maharayar in respect of four persons for a sum of 200 *panam* received from the same person.

53. THREE CHOLA INSCRIPTIONS, TIRUMALAI, DISTRICT NORTH ARCOT.—Occurring on the rock near the steps leading to the Chandraprabhasvami Jaina temple, all the three Tamil inscriptions are in Tamil characters. The one in characters of the tenth century is dated in the sixth regnal year of Maduraikonda Rajakesari and records the grant of sheep for a perpetual lamp for Tirumalai-devar at Vaigavur by Ekaviran Danmasangadiyar *alias* Malaiyar-maha-deviyar, the consort of Nattan Sittavadattadigal of Maladu and the daughter of Nadalvar Ilangonadigal. Similar gift to the same deity by Kanakanandi-acharyar, the disciple of Nathadevar is recorded in the inscription dated in the tenth regnal year (A.D. 994-95) of Rajaraja I. The third dated in the tenth regnal year (A.D. 1061-62) of Rajendra II records the assignment, made by a body called Chittiramelipperukkalar of shares of the produce from both the lands under *devadanam* and *pallichchandam* (pl. XXXII A and B).

54. PANDYA INSCRIPTION, KALLUMADAI, DISTRICT RAMANATHAPURAM.—It is a Tamil inscription engraved in Vatteluttu characters of about the tenth century and is dated third (2+1) regnal year of Chadaiyan Maran and records the gift of twenty-five cows for burning one perpetual lamp for the deity Isvara-bhatara in a village by Keralasinga-Muttaraiyan *alias* Madevan Marudan.

55. PANDYA INSCRIPTION, MATTAYAMPATTI (DASAVILAKKU), DISTRICT SALEM.—This Tamil inscription in characters of the fourteenth century from the Ulagesvara temple dated in the twenty-sixth regnal year of the king Chadaiyavarman Sundarapandya records the share of income to be distributed to the various deities from the *madaivilagam* set up by some individuals of the Vellalankannandai community of Disaivilakku in Puvaniya-nadu.

ARABIC AND PERSIAN INSCRIPTIONS[1]

ANDHRA PRADESH

1. CHANDA BIBI'S INSCRIPTION, HYDERABAD, DISTRICT HYDERABAD.—One more inscrip tion of the famous Chanda Bibi, daughter of Raj Kunwar Bai recording the construction of a mosque in A.H. 1232 (A.D. 1816-17) was found.

2. EPITAPHS, HYDERABAD, DISTRICT HYDERABAD.—A number of epitaphs were found at different places in Hyderabad: they belong to persons of Iranian domicile or origin like Mir Zainu'l-Abidin, son of Abdu'1-Hayy al-Husaini al-Musawi (d. A.H. 1027 = A.D. 1617-18), Zainab whose father's name is illegible (d. A.H. 1034 = A.D. 1625), Mir Sultan Muhammad, son

[1]Information from Dr Z. A. Desai, Director (Epigraphy). Dr Desai assisted by Shri F. M. Khan, Dr A. A. Kadiri and Shri S. S. Hussain and Dr M. Y. Quddusi found, copied, examined and reported on two hundred and five inscriptions during the year, of which important ones are noticed here.

of Mir 'Abdu'l-Karim Mazandarani (d. A.H. 1079=A.D. 1668), Shah Muhammad, son of Mir Salih Mashhadi (d. seventeenth century), Muhammad, son of Malik Muhammad, son of 'Ali (d. A.H. 1084 = A.D. 1673-74) and the like. Another inscription from Hyderabad records the construction.

3. MISCELLANEOUS INSCRIPTIONS, HYDERABAD, DISTRICT HYDERABAD.—An inscription from the place records the construction of a Ta'lim (i.e., a place for physical exercises like wrestling) by one Baqir 'Ali in A.H. 1206 (A.D. 1791-92).

DELHI

4. TWO INSCRIPTIONS FROM BASTI NIZAMUDDIN, DELHI.—According to a fragmentary and damaged inscription from this locality, one Yusuf died in A.H. 791 (A.D. 1388-89); the deceased is stated to have been the 'lamp of the House of Ansar' i.e. he belonged to a respectable Ansari family. Another interesting inscription from the same area records the martyrdom of Khwaja Dust Muhammad in A.H. 970 (A.D. 1562); he is stated to have been killed in a battle fought at Pachwara.

GUJARAT

5. EPITAPHS, AHMADABAD, DISTRICT AHMADABAD.—An early fragmentary epitaph dated A.H. 856 (A.D. 1452) was found here. Another fragmentary but interesting epitaph from the same place refers to the deceased Miyan Da'udji'u, son of Miyan Idris as a great Shaikh who devoted most of his time to Qur'an recitation and offered midnight prayers in great abundance.

6. INSCRIPTION OF SULTANS OF GUJARAT, AHMADABAD, DISTRICT AHMADABAD.—An inscription referring to the reign of Muhammad Shah II assigns the construction of a mosque to Bibi Baddu, Wet-nurse *(hiva)* of Maliku'sh-Sharq 'Imadu'l-Mulk in A.H. 850 (A.D. 1446-47).

7. GROUP OF EPITAPHS, KUTIYANA, DISTRICT JUNAGADH.—These epitaphs refer to the demise of persons who appear to be members of a local learned family of the early nineteenth century, viz., Makhdum Yar Muhammad and his son Mukhdum Khan Muhammad (died A.H. 1256=--A.D. 1840), the latter's son Maulavi Muhammad Hashim (died A.H. 1281 =A.D. 1864), Shah Ghulam Muhammad and Makhdum Muhammad Shafi; the family appears to have hailed from Bukhara in Central Asia in modern Uzbekistan Soviet Socialist Republic. An epitaph from Kutiyana records the death of a saintly person Makhdum Shaikh Ibrahim Naqshbandi in A.H. 1117 (A.D. 1705-06).

8. MUGHAL INSCRIPTION, KUTIYANA, DISTRICT JUNAGADH.—An interesting visitor's record, dated in the reign of Muhammad Shah was found on a tomb here; it was recorded by 'Abdul-Aziz, the Attendant *(Khadim)* at (the shrine of) Shah Jamman Jalal Chishti (a famous Chishti saint of Ahmadabad), who had come from Ahmadabad in the emperor's eleventh regnal year corresponding to A.H. 1141 (A.D. 1729).

9. EPITAPH, CHAMPANER, DISTRICT PANCH MAHALS.—According to the epitaph, Fakhru'd-Din, son of Haji 'Ali, son of Ibrahim, obtained martyrdom in A.H. 895 (A.D. 1490).

10. EPITAPHS, SURAT, DISTRICT SURAT.—Two epitaphs from Surat belong to two persons of Arab domicile or descent, namely Shaikh Abu Bakr (died A.H. 1218 = A.D. 1803) and Shaikh Bukran,son of `Abud Basharahil (died A.H. 1268 A.D. 1852). These are composed in Arabic verse.

11. INSCRIPTIONS OF SULTANS OF GUJARAT, TADKESHWAR, DISTRICT SURAT.—A slightly-damaged bilingual record of Muzaffar Shah II records the construction of a mosque by Khan-i-Azam Dastur Khan at the suggestion of Malik Mubarak, (son of) Jalal in A.H. 919 (A.D. 1513-14). It also names Maulana 'Amtu(?) Barkhurdar, son of Ibrahim as mason.

There is another inscription recording the construction of a mosque in A.H. 933 (A.D. 1527) during the reign of Qutbu'd-Dunya Wa'd-Din Abu'1-Fadl Bahadur Shah II, by His Excellency Khan-i-A'Zam Khaqan-i-Mu'azzam Ikhtiyar Khan under the supervision of Malik Abdu's-Samad, son of Muhammad (?), son of Hasm Quraishi.

12.TUGHLUQ, INSCRIPTION, PATDI, DISTRICT SURENDRANAGAR.—An epigraph of' Firuz Shah Tughluq records the construction of a mosque in A.H. 770 (A.D. 1369) by Malik Dilshad 'Imadu'1-Mulk.

13. INSCRIPTION OF MUZZAFFAR SHAH II, THE SULTAN OF GUJARAT, SARA, DISTRICT SURENDRANAGAR.—It states that a mosque was built by Da'ud, son of Ala Modher in the time of Malikji'u Qutb, during the years A.H. 929-930 (A.D. 1522-23), when Muzzaffar Shah II was the Sultan of Gujarat.

14. EPITAPHS IN MOSQUES, VADODARA, DISTRICT VADODARA.—Of the three important epitaphs of the fourteenth and fifteenth centuries in Arabic Kufic and Naskh characters in a mosque here, the one, which is more ornate, records the demise of the great master among the merchants named Khwaja Adam, son of Khwaja Muhammad Shah, son of Yaqub, on Tuesday, the 23rd of the Muharram, A.H. 701 (28 September of A.D. 1301). Another epigraph records that Haddad (?), son of Ibrahim, son of Nudah (?), son of Suleiman, son of 'Ali, son of Abdullah died on Sunday, the 15th of Jamadi-ul-Awwal, A.H. 818 (23 July of A.D. 1415).

An epitaph from the other mosque in the same town records A.H. 1215 (A.D. 1800) as the date of demise of Haider, son of Ahmed.

MADHYA PRADESH

15. INSCRIPTION OF THE MUGHALS, BARI, DISTRICT GUNA.—An interesting but damaged record of the 30th regnal year of Aurangzeb, corresponding to A.H. 1097 (July-November of A.D. 1686) from the place states that Bahadur Shah, son of Alam Shah, son of Firuz Shah, son of Qadir Shah, who was a brother of Tughluq Shah, constructed a well in a garden for public use. It further states that Firuz Shah had established his rule at Kalpi and was succeeded by his son and grandson (cf. *Annual Administration Report of the Archaeological Department, Gwalior State,* for Vikram Samvat 1993, Year 1936-37, p. 11, no. 39; also *Indian Archaeology 1967-68—A Review,* p. 59, no. 8).

16. EPITAPH, CHANDERI, DISTRICT GUNA.—A fragmentary epitaph from the place records the death of a nobleman Khan-i-Azam Mansur-Khan; its date portion is lost but it is assignable to the Malwa Sultanate period.

17. MOSQUE-INSCRIPTION, SHADORAGAON, DISTRICT GUNA.—Dated A.H. 1031 (A.D. 1621-22), it records the construction of a Jami' Masjid and a step-well by Arab Hiravi, a servant of Khwaja Yaqut A record referring to the construction of a mosque and a step-well by the same person in AH 1041 (A.D. 1631) has been noticed in the *Indian Archaeology 1969-70—A Review* where the builder's name was read as Khwaja Yaqut Arab, son of lath Hirawi, instead of 'Arab, son of Fath Hirawi, a servant of Khwaja Yaqut.

MAHARASHTRA

18. MISCELLANEOUS INSCRIPTION, BAHADURPUR, DISTRICT JALGAON.—The fragmentary inscription states that the work of construction of the gate of the town (?), completed in Fasli 1117 (A.D. 1709) was carried out under the supervision of Muhammad Wazir (?) Khan Lodi, the Deputy *(Na'ib)* Faujdar of Suri (?) Khan, *alias* 'Abdu'llah Khan.

PUNJAB

19. INSCRIPTION OF EMPEROR AKBAR, BARECHAN, DISTRICT PATIALA.—It is a damaged inscription and records the construction of a mosque in A.H. 983 (A.D. 1575-76).

20. INSCRIPTION OF EMPEROR AKBAR, CHHINTANWALA, DISTRICT PATIALA.—This inscription (pl. XXXIII A) assigns the construction of a mosque and digging of a well to an official, Khwajam Quli, a servant of Abu'l-Mafakhir Mirza Sharafu'd-Din Muhammad Hussain and (his consort) Nawwab Begam Sultani, in A.H. 976 (A.D. 1568).

21. INSCRIPTION OF EMPEROR AKBAR, SAMANA, DISTRICT PATIALA.—Dated A.H. 1008 (A.D. 1600) it records the construction of a mosque by Mansur at the instance of a great Khan (name not mentioned).

22. JAHANGIR'S INSCRIPTION, SAMANA, DISTRICT PATIALA.—It states that an old mosque built in A.H. 911 (A.D. 1505-06) by Amir Amanullah, the Chief of the Sayyids, during the reign of Sikandar Lodi, was reconstructed through the efforts of Siddiq, son of 'Abdu'llah, in A.H. 1025 (A.D. 1616), during the reign of Jahangir (cf. G. J. Rodgers, *Report of the Panjab Circle of the Archaeology Survey,* 1888-89, p. 22).

23. MISCELLANEOUS INSCRIPTIONS, SAMANA, DISTRICT PATIALA.—One of the inscriptions records the construction of the tomb of Mir 'Abdu'llah al-Husaini in A.H. 1022 (A.D. 1613-14). Another epigraph from the same place assigns the construction of a mosque in the territory of Samana to Fath Muhammad in A.H. 1057 (A.D. 1647-48).

UTTAR PRADESH

24. DONATIVE INSCRIPTION, BAHRAICH, DISTRICT BAHRAICH.—Dated A.H. 1198 (A.D. 1783-84), it refers to the endowment of a village as an offering to the Dargah (of Amir Mas'ud Salar) for the merit of Bakhshu'llah.

25. INSCRIPTION OF THE SURS, DAIPUR, DISTRICT FARRUKHABAD.—The inscription which appears to be a recent copy of an old epigraph, records the construction of a mosque of Shergarh (old name Daipur) in A.H. 952 (A.D. 1545-46) during the time of Islam Shah, under the supervision of Sayyid Hasan, son of Muhammad.

26. MOSQUE-INSCRIPTION, DAIPUR, DISTRICT FARRUKHABAD.—The record assigns the construction of a mosque to Kamalu'd-Din Husain in the year A.H. 1147 (A.D. 1734-35). It was inscribed by Muhibbu'llah Rajgiri.

27. MISCELLANEOUS INSCRIPTION, KAMPIL, DISTRICT FARRUKHABAD.—It records the name of Nahmal Das Khiradmand Khani and the date A.H. 1127 (A.D. 1714-15).

28. MUGHAL INSCRIPTION, KAMPIL, DISTRICT FARRUKHABAD.—A lengthy inscription composed in cumbersome Persian verse refers to the reign of Shah'Alam II and records the construction of a *Bishrant (Visrant)* i.e. Rest House on the bank of the sacred river in A.H. 1214 (A.D. 1799-1800) for the benefit of the people who came for the holy dip through the joint efforts of Guzarprasad Mulchand, Faqirullah and 'Ibadu'llah and under the overall supervision of Ram Ganga Sahib, by Rai Nahmal Das, son of Lala Khubchand, who was born at Qasba K(or G)odhnahr. The builder was a high revenue official under Aminu'd-Daula, the Deputy *(Na'ib)* in the time of (Nawwab Nasir Jang Bangash, the Deputy *(Na'ib)* of the Mughal emperor. It also states that the British had established their hold on India. The metrical text was composed by 'Azizu'llah 'Aai of the Qadizada family of Shamsabad.

29. MOSQUE-INSCRIPTION, KHUDAGANJ, DISTRICT FARRUKHABAD.—It records the construc tion of a mosque in A.H. 1152 (A.D. 1739-40) by Yaqut.

30. MOSQUE-INSCRIPTION, SHAMSABAD, DISTRICT FARRUKHABAD.—Composed by Rida'i, it assigns the construction of a mosque to Muhammad Khan in A.H. 1006 (A.D. 1597-98).

31. EPITAPH, FATEHPUR, DISTRICT FATEHPUR.—A person of Iranian domicile or origin, Karam Baig, son of Haidar Baig of Kirman Shah died in A.D. 1767.

32. MUGHAL INSCRIPTION, HASWA, DISTRICT FATEHPUR.—This record of the time of emperor Shah Jahan refers to the construction of an `Idgah by Khwaja Ahmad, son of Firuz, son of Mir Husain Chaudhari in A.H. 1051 (A.D. 1641-42). It also gives the names of the masons responsible for its construction, namely Hamid Jalal and Thanai.

33. EPITAPH, JAHANABAD (KORA), DISTRICT FATEHPUR.—One of the epitaphs records the death of a person of Iranian domicile or origin, Mir Yahya, son of Mir Qiwamu'd-Din Muhammad al-Musawi Nishapuri, who died in A.H. 1180 (A.D. 1766).

34. MUGHAL INSCRIPTIONS, JAHANABAD (KORA), DISTRICT FATEHPUR.—An inscription of Aurangzeb records the construction of a Jami' mosque in A.H. 1079 (A.D. 1668-69) by Shaikh Badha, a *karori* (tax-collector) of the *Shiq* i.e. Revenue Division (name illegible).

A record from Shah 'Alam I, ascribes the construction of a mosque to Jauhar Khan in the first regnal year corresponding to A.H. 1119 (A.D. 1707).

Similarly, an inscription of Ahmad Shah records the construction ol a mosque by 'Aja'b Malzadi with the help of the people in the emperor's fifth regnal year (A.D. 1752-53).

35. MUGHAL INSCRIPTION, GHATAMPUR, DISTRICT KANPUR.-—In the forty-eighth regnal year (A.H. 1116 = A.D. 1703-04) of Aurangzeb a well was constructed by Ram Singh Kayath (i.e. Kayasth), a resident of that village.

36. MUGHAL INSCRIPTION, MUSANAGAR, DISTRICT KANPUR.—A badly-damaged inscription refers to the construction of some edifice (probably a mosque) by someone (name lost) in the twenty-eighth regnal year of Muhammad Shah corresponding to A.H. 1159 (A.D. 1745).

37. MUGHAL INSCRIPTIONS, KHERI, DISTRICT KHERI (LAKHIMPUR).—Belonging to the reign of Shah Jahan, one of the epigraphs refers to the erection of a mosque in A.H. 1058 (A.D. 1648).

An inscription of Aurangzeb records the construction of a mosque in A.H. 1073 (A.D. 1662-63) by a person whose name is mentioned as Nihal.

38. MOSQUE-INSCRIPTION, SHAHJAHANAPUR, DISTRICT SHAHJAHANAPUR.—This inscription records the construction of a mosque in A.H. 1155 (A.D. 1742-43), by Ranmast Khan.

39. MUGHAL INSCRIPTION, SHAHJAHANAPUR, DISTRICT SHAHJAHANAPUR.—This inscription of Shah Jahan records the construction of a mosque and digging of a well in A.H. 1057 (A.D. 1647-48), by Khwaja Buland in that town founded and beautified by Bahadur Khan.

40. MOSQUE-INSCRIPTION, BISWAN, DISTRICT SITAPUR.—A mosque was built by Mumtaz Mu'tamad Khani in A.H. 1047 (A.D. 1637-38).

41. EPITAPH, KHAIRABAD, DISTRICT SITAPUR.—It records the death of a saint described as the 'Sun of the Islamic laws and Pole-star of the Universe' in A.H. 993 (A.D. 1584-85).

42. MUGHAL INSCRIPTION, KHAIRABAD, DISTRICT SITAPUR.—An inscription of Shah Jahan assigns the construction of a mosque to Qadi 'Abdu's-Sami', son of Qadi 'Abdu'l-Ghani in A.H. 1060 (A.D. 1650).

43. GROUP OF THREE INSCRIPTIONS, LAHARPUR, DISTRICT SITAPUR.—A group of three epigraphs records the construction of the tomb of a preacher of religion Shaikh 'Abdu'r-Rahman, built in his life-time in A.H. 956 (A.D. 1549)—two decades before his demise in A.H. 976 (A.D. 1568-69); two of these records were composed by Ahmad 'Ali Laharpuri (i.e. of Laharpur) and Shukri.

WEST BENGAL

44. MOSQUE-INSCRIPTION, KHUSHTIGIRI, DISTRICT BIRBHUM.—The inscription ascribes the construction of a mosque to Mubarak Shah Manduza'i in A.H. 1139 (A.D. 1726-27).

45. MOSQUE-INSCRIPTION, SEKEDDA, DISTRICT BIRBHUM.—It records the construction of a mosque in the enclosure of the *dargah* of Ahmad by Khurram 'Ali Khan in A.H. 1196 (A.D. (A.D. 1781-82).

46. INSCRIPTION OF SULTANS OF BENGAL, SURI, BIRBHUM.—A record of 'Alau'd-Din Husain Shah records the construction of a reservoir by the king in A.H. 922 (A.D. 1516). However, it is difficult to say if this inscription is identical with the one noticed in the *Journal^ of the Asiatic Society of Bengal,* XXX (1861), p. 390, which was stated to be from 'a ruined Mosque (so described by the Executive Officer) on the old Badshahee road which is still traceable through the Beerbhoom District' (pl. XXXIII B).

47. MUGHAL INSCRIPTION, KATWA, DISTRICT BURDWAN.—The inscription, composed in Arabic, of Farruk Siyar, records the construction of a mosque by 'Alam Khan in A.H. 1129 (A.D. 1716-17).

III. NUMISMATICS AND TREASURE TROVE[1]

ANDHRA PRADESH

1. SILVER COINS, CHINMIR TALUK, DISTRICT ADILABAD.—Seventy-three silver coins issued by the Mughal rulers were acquired as a treasure trove.

2. SILVER COINS, LUXETTIPET TALUK, DISTRICT ADILABAD.—One hundred and forty-eight silver coins of the Mughal rulers were acquired as a treasure trove find.

3. VIJAYANAGARA GOLD COINS, DISTRICT ANANTAPUR.—Thirty gold coins issued by the Vijayanagara rulers were acquired as a treasure trove find.

4. COPPER COINS, KADRI TALUK, DISTRICT ANANTAPUR.—Thirty gold coins issued by the Vijayanagara rulers were acquired as a treasure trove find.

5. GOLD COINS, CUDDAPAH, DISTRICT CUDDAPAH.—Two gold coins of Vijayanagara ruler (Rangaraya II?) were acquired under the Treasure-trove Act.

6. GOLD COINS, MYLAVARAM, DISTRICT CUDDAPAH.—One hundred and thirty-four gold coins of Hindu (pi. XXXI B) and Muslim rulers (pl. XXXI C), respectively of fifteenth to seventeenth century and eighteenth century A.D., were discovered.

7. GOLD COINS, RAJAMUNDRY TALUK, DISTRICT EAST GODAVARI.—Three hundred and fifty-four gold coins, probably the issues of Pallava rulers, and a brass container were acquired under the Treasure-trove Act.

8. PUNCH-MARKED COINS, GUNTUR, DISTRICT GUNTUR.—Seven silver punch-marked coins were acquired under Treasure-trove Act.

9. COINS, HYDERABAD, DISTRICT HYDERABAD.—Nine full and three half gold issues of the Mughals, eleven copper coins containing issues of Asaf Jahi and Bahamani rulers and fourteen full and four half silver coins of the Mughal rulers were acquired under the Treasure-trove Art.

10. COINS, KARIMNAGAR, DISTRICT KARIMNAGAR.—TWO hundred and eighty-four coins as well as one hundred and sixteen broken coins of Satavahana period and (bur silver issues of the Mughal rulers were acquired.

11. GOLD COINS, KHAMMAM TALUK, DISTRICT KHAMMAM.—Five gold coins of the rulers of Western Chalukyan dynasty were acquired as a treasure trove find.

12. GOLD COINS, SATHUPALLI TALUK, DISTRICT KHAMMAM.—Twelve gold coins of the rulers of Khalji dynasty and others were acquired as treasure trove.

[1]Information from: 1-5, 7-23, the Department of Archaeology and Museums, Government of Andhra Pradesh ; 6, the South-eastern Circle of the Survey ; 24-27, the Department of Archaeology, Government of Gujarat; 28, the Mid-southern Circle of the Survey; and 29, the Western Circle of the Survey.

13. GOLD COINS, ACHAMPET TALUK, DISTRICT MAHBUBNAGAR.—Twenty-seven gold issues of the rulers of Vijayanagara dynasty were acquired as a treasure trove.

14. GOLD COINS, ATMAKUR TALUK, DISTRICT MAHBUBNAGAR.—Seventeen gold coins of the rulers of the Vijayanagara dynasty, namely Harihara, Krishnadeva-raya, Achutya-raya and Sadasiva-raya were acquired.

15. COPPER COINS, MEDAK, DISTRICT MEDAK.—Forty-eight copper issues of Adil Shahi (?) along with one iron spear were acquired as a treasure trove find.

16. SILVER COINS, SURYAPET TALUK, DISTRICT NALGONDA.—Fourteen silver coins, of which one of Asaf Jahi, one of Afzal'ud-Daulah, eleven of Mahboob Ali Khan and one melted, were acquired as a treasure trove find.

17. SILVER COINS, BANSWADA TALUK, DISTRICT NIZAMABAD.—As a treasure trove find twenty eight silver issues of the Mughal rulers were acquired.

18. SILVER COINS, KAMAREDDY, DISTRICT NIZAMABAD.—Forty silver coins of Asaf Jahi were acquired.

19. COINS, NIZAMABAD, DISTRICT NIZAMABAD.—Fifty-two gold issues of the Vijayanagara rulers and forty-eight silver coins of Mughal rulers were acquired as treasure trove.

20. SILVER COINS AND GOLD WIRES, MULUG TALUK, DISTRICT WARANGAL.—Twenty-two silver coins of Bahamani Adil Shahi and two pieces of gold wire were acquired as treasure trove.

21. SILVER COINS, MUNGAPET TALUK, DISTRICT WARANGAL.—Ninety-five silver coins of the Mughal rulers were acquired as a treasure trove find.

22. SILVER COINS, WARANGAL, DISTRICT WARANGAL.—Twenty-four silver issues of Asaf Jahi were acquired as treasure trove.

23. COINS AND GOLD CHAIN, NARSAPUR, DISTRICT WEST GODAVARI.—Two copper coins, one each of Asaf Jahi VII and East India Company, two gold coins, one each of Mohammad Shah and Tughlaq Shah and a gold chain were acquired as a treasure trove find.

GUJARAT

24. COPPER IMAGES, BHUJ, DISTRICT KUTCH.—Two copper images of the goddess Sarasvati, belonging to *circa* tenth-eleventh century A.D., were recovered as treasure trove.

25. COPPER-PLATES, VADNAGAR, DISTRICT MAHESANA.—A set of copper-plates, found to be the *dana-sasana* of Maitraka King Shiladitya III {*Valabhi Samvat* 319?), were recovered as a treasure trove.

26. SILVER COINS, MAHUVA, DISTRICT SURAT.—A hoard of one thousand five hundred and sixty-two silver issues of the Muslim ruler of fifteenth century A.D. were found as a treasure trove find.

27. JAINA BRONZE, ZINZUWADA, DISTRICT SURENDRANAGAR.—One Jaina bronze image was found as treasure trove.

KARNATAKA

28. VIJAYANAGARA COINS, MANDEKOLU, DISTRICT SOUTH KANARA.—A hoard of twenty gold coins of the Vijayanagara ruler Sadasiva-raya, in a copper casket, was discovered as treasure trove.

RAJASTHAN

29. COPPER COINS, DISTRICT BANSESWARA.—Ninety-two copper issues of the Gujarat Sultans, the majority being of Sultan Mahmud Shah I (A.D. 1458-1511), were found as a treasure trove find.

IV. OTHER IMPORTANT DISCOVERIES

ANDHRA PRADESH

1. ASH-MOUNDS, BUDIDAGADDAPALLI, DISTRICT ANANTAPUR.—Three ash-mounds were located in the vicinity of the village by the Registering Officer (Anantapur) of the Department of Archaeology and Museums, Government of Andhra Pradesh. The mounds yielded, besides neolithic pottery, polished stone tools, rubbers, querns, etc.

2. LOWER PALAEOLITHIC TOOLS, CHINTALAPALEM, DISTRICT CHITTOOR.—Dr V. Rami Reddy and Shri S. Bhaskar of the Department of Physical Anthropology and Prehistory, Sri Venkateswara University, collected Lower Palaeolithic tools, datable to late Acheulian period, from a fine gravel-deposit overlying a pebbly gravel of a stratified section as also from the surface. The tools include choppers, chopping-tools, handaxes of various sub-types, cleavers, scrapers of various sub-types, micro-lunate, flakes and cores, made on the locally available water-worn pebbles of coarse to fine-grained quartzite.

3. LOWER PALAEOLITHIC TOOLS, MARATIPALEM, DISTRICT CHITTOOR.—Dr Rami Reddy and Shri S. Bhaskar of the Department of Physical Anthropology and Prehistory, Sri Venkateswara University, collected Lower Palaeolithic tools, made on locally available water-worn pebbles of coarse to fine-grained quartzite. The tools, belonging to the late Acheulian tradition, include chopping-tools, handaxes, cleavers, scrapers, scrapers-cum-borer, discoids and flakes.

4. PALAEOLITHIC TOOLS, PALLAM, DISTRICT CHITTOOR.—Dr V. Rami Reddy and Shri S. Bhaskar of the Department of Physical Anthropology and Prehistory, Sri Venkateswara University, collected tools belonging to the Lower, Middle and Upper Palaeolithic periods. The tools include Acheulian handaxes of various sub-types, choppers, chopping-tools, cleavers, miniature handaxes, borers, retouched blades, scrapers, borer-cum-scrapers, points, blades, broken mace-head, indeterminate flakes and worked pieces.

5. EARLY HISTORICAL SITE, PEDDACHEPALLI, DISTRICT CUDDAPAH.—An extensive mound of nearly 7-m height was noticed by the Registering Officer (Tirupati) of the Department of Archaeology and Museums, Government of Andhra Pradesh. The site yielded pottery including black-and-red, red polished and red wares. A ring-well was also noticed in a section of the mound.

6. EARLY HISTORICAL SITE, KOTILINGALU, DISTRICT CUDDAPAH.—An early historical site yielding pottery of the Satavahana period and coins of Simukha, the first king of the Satavahana dynasty, was noticed by the Department of Archaeology and Museums, Government of Andhra Pradesh.

ASSAM

7. CARVED STONE PIECES, MAJGAON, DISTRICT DARRANG.—A few carved stone pieces, probably of two post-Gupta temples, belonging to *circa* eighth-ninth century A.D., were found by the Department of Archaeology and Museums, Government of Assam.

8. NEOLITHIC CELT, GAUHATI, DISTRICT GAUHATI.—Shri Dilip K. Medhi of the Arya Vidyapeeth College, Gauhati and Dr S. N. Rajaguru of the Deccan College Post-graduate and Research Institute, Pune, in the course of their reconnaissance around Gauhati, discovered a piece of a neolithic celt in a colluvial reddish soil derived from weathering of the gneissic rock.

BIHAR

9. EARLY HISTORICAL SITE, FOUJDARI, DISTRICT BHAGALPUR.—An early historical site, yielding Northern Black Polished Ware, was noticed at Foujdari village, 30 km east of Antichak, by Shri Ajoy Kumar Sinha, Registering Officer (Gaya) of the Department of Archaeology and Museums, Government of Bihar.

10. NORTHERN BLACK POLISHED WARE SITES, DISTRICT GAYA.—Dr Sarjug Prasad Singh, Registering Officer of the Department of Archaeology and Museums, Government of Bihar, located sites yielding Northern Black Polished Ware at Amarut, Kukra, Manpur and Nagragarh.

11. INSCRIBED TERRACOTTA BALLS, DISTRICT GAYA.—Two terracotta balls, of which one bearing an inscription *Bhudatta devasysa* in fifth century A.D. characters and the other with an inscription reading *Mahidharadaksh deva* in eighth century A.D. characters, were obtained by Dr Sarjug Prasad Singh, Registering Officer of the Department of Archaeology and Museums, Government of Bihar.

12. MICROLITHS, BARABAR, DISTRICT GAYA.—Sarvashri R. S. Bisht and D. P. Sinha of the Mid-eastern Circle of the Survey collected microliths from the water-borne deposit of yellowish kankary earth at the foot of the Barabar hill.

13. CHALCOLITHIC SITE, MASAURHA, DISTRICT PATNA.—Sarvashri K. P. Gupta and D. P. Sinha of the Mid-eastern Circle of the Survey discovered an ancient site, yielding black-and-red ware having chalcolithic affinity and microliths including blades, lunates, points and fluted cores.

14. MICROLITHS, BENISAGAR, DISTRICT SINGHBHUM.—Shri K. P. Gupta of the Mid-eastern Circle of the Survey collected microliths including blades, scrapers, besides fluted cores.

15. ANCIENT SITE, HAJIPUR, DISTRICT VAISHALI.—Shri R. S. Bisht of the Mid-eastern Circle of the Survey discovered an ancient site (Ram Chaura), yielding Northern Black Polished Ware and associated wares and pottery of the Sunga, Kushana, Gupta and medieval times.

16. ANCIENT SITE AND TEMPLE, KONHARA GHAT, DISTRICT VAISHALI.—Shri R. S. Bisht of the Mid-eastern Circle of the Survey discovered an ancient site yielding Northern Black Polished Ware and associated wares and pottery of the Sunga, Kushana, Gupta and medieval times. He also noticed a temple built in the Nepalese style of eighteenth-nineteenth century A.D., bearing beautifully chiselled carvings of deities, erotic figures and floral work on its wooden door jambs, eaves and brackets. Some medieval sculptures are found housed in this temple.

GOA, DAMAN AND DIU

17 CANNON AND ANCHOR, MARMAGAO, GOA.—Shri B. K. Saran of the Survey reports the discovery from the sea of an anchor and two large-sized steel cannons one belonging to the

Portuguese with inscription dated A.D. 1636 and the Portuguese emblem, and the other to the British.

GUJARAT

18. SCULPTURES, AGHAR, DISTRICT AHMADABAD.—A hoard of twenty-four sculptures including those of Brahma, Ganesa and Vishnu, in various forms in white marble, datable to *circa* thirteenth century A.D., were found by the Department of Archaeology, Government of Gujarat.

19. SCULPTURES, DHOLKA, DISTRICT AHMADABAD.—Shri S. S. Nayak of the Western Circle of the Survey found four sculptures including those of a goddess seated in *lalitasana [circa* twelfth century A.D.) , Vaishnavi, a white marble *Saritobhadrika pratima* of Jaina Adinatha seated in *Dhyanamudra {circa* tenth century A.D.) and Hanuman (eighteenth century A.D.).

20. SCULPTURES, ISLAMPURA, DISTRICT AHMADABAD.—Shri S. S. Nayak of the Western Circle of the Survey found sculptures of Lakshmi-Narayana *{circa* fourteenth century A.D.) and Hanuman *{circa* seventeenth century A.D.).

21. BRONZE IMAGE, GADH MAHUDI, DISTRICT BANAS KANTHA.—A bronze image of Jaina *tirthankara,* recovered from the bed of the river Dhomanai is preserved in the office of the Northern Circle of the Department of Archaeology, Government of Gujarat.

22. SCULPTURES, RAVEL, DISTRICT BANAS KANTHA.—Two marble sculptures of Jaina *tirthankaras,* Santinatha and Ajitnatha, belonging to *circa* eleventh century A.D. were found by the Department of Archaeology, Government of Gujarat.

23. ANCIENT SITE, ADHEWADA, DISTRICT BHAVNAGAR.—Shri S. S. Nayak of the Western Circle of the Survey discovered an ancient site, yielding vestiges of the early historical and medieval times. The surface collection includes black-and-red, red and black wares and a few terracotta objects.

24. SCULPTURES, TIMANA, DISTRICT BHAVNAGAR.—Sculptures of Jaina *Parikar* in marble, Lakshmi and Indra in sandstone, all belonging to *circa* thirteenth-fourteenth century A.D. were found by the Department of Archaeology, Government of Gujarat.

25. SCULPTURE, KEVADRA, DISTRICT JUNAGADH.—A sculpture of Surya in sandstone, datable to *circa* tenth century A.D. was found by the Department of Archaeology, Government of Gujarat.

26. SCULPTURE, MODHERA, DISTRICT MAHESANA.—Dr B. L. Nagarch of the Western Circle of the Survey found a sculpture of two-armed seated Surya flanked on either side by *chauri-bearers,* probably belonging to the twelfth century A.D.

27. SCULPTURES, PATAN, DISTRICT MAHESANA.—Shri P. K. Trivedi of the Western Circle of the Survey found five marble sculptures of Jaina pantheon. The images include two standing *tirthankaras* in *kayotsarga-mudra,* a fragmentary image of Suparsvanatha with seven-hooded serpent on his head, seated Jaina *tirthankara* and a seated image of Sambhavanatha with an inscription dated *Samvat* 1228.

28. INSCRIBED STONE, SANGHPUR, DISTRICT MAHESANA. — An inscription belonging to V.S. 1546 (A.D. 1490) was noticed by the Department of Archaeology, Government of Gujarat.

29. SCULPTURES, BALALA, DISTRICT SURENDRANAGAR.—Three sculptures of Surya, Suryani and *padma-paduka* in marble, belonging to *circa* fourteenth century A.D. were noticed by the Department of Archaeology, Government of Gujarat.

30. TERRACOTTA OBJECTS, AJABPURA, DISTRICT VADODARA.—Two terracotta miniature figurines representing goddess belonging to the Kshatrapa period, found at Ajabpura, are now kept in the office of the Southern Circle of the Department of Archaeology, Government of Gujarat.

31. SCULPTURES, VYARA, DISTRICT VADODARA.—Dr B. L. Nagarch of the Western Circle of the Survey discovered a number of medieval sculptures belonging to Hindu and Jaina pantheons. Noteworthy among them are those of Brahma, Brahmini, Indra, Mahishasura-mardini, Aindri, Lakulisa, Andhakantaka, Siva and Jaina *tirthankara* Adinatha.

HARYANA

32. EARLY HISTORICAL SITE, JATAULI, DISTRICT GURGAON.—Shri Dharambir Sharma of the Delhi Circle of the Survey discovered an early historical site at Jatauli.

33. RANG MAHAL SITES, DISTRICT MAHENDERGARH.—Shri K. N. Dikshit, assisted by Sarvashri Lai Chand Singh, R. S. Sharma and B. R. Meena, of the Excavations Branch (II) of the Survey discovered sites yielding Rang Mahal pottery at Gahli, Patikara and Raghunathpura on the bank of the river Dohan.

JAMMU AND KASHMIR

34. ANCIENT STUPA, WUSHKURA, DISTRICT BARAMULLA.—Clearance work undertaken by the North-western Circle of the Survey under Shri H. K. Narain, revealed a part of the plinth of the earlier stupa, laid on rammed clay bed and a copper coin of Tormana of the fifth-sixth century A.D.

35. SCULPTURE, KHREW, DISTRICT SRINAGAR.—-Shri S. L. Shali of the North-western Circle of the Survey discovered a sculpture of Vishnu with three heads and wearing usual crown, flanked by *Gada-devi* and *Chakra-purusha* and *Bhu-devi* near his feet.

KARNATAKA

36. HISTORICAL SITES, DISTRICT BIJAPUR.—Shri S. K. Joshi of the Mid-southern Circle of the Survey identified monuments and sites referred to in the Tahkota War (fifteenth century A.D.) at Chaya Tirtha, Dered Hola, Gori Hola, Jaladurga, Kodekal, Rajan Kolur, Salugallu.

37 APSIDAL TEMPLE AND SCULPTURES, AIHOLE, DISTRICT BIJAPUR.—Remains of an apsidal temple and a few sculptures of Ardhanarisvara, Lakulisa, Karttikeya, Nandi, Harihara, etc., probably belonging to the first half of the sixth century A.D. were exposed in the clearance work carried out by the Mid-southern Circle of the Survey.

38. TEMPLES AND SCULPTURES, KALASAPUR, DISTRICT DHARWAR. Sarvashri

K. Venkateswara Rao and S. K. Joshi of the Mid-southern Circle of the Survey noticed two temples, locally known as Ramalingesvara and Bana Sankari, a huge standing sculpture of Gomatesvara (3-15 m), a seated Mahavira (1-20 m), both made of black basalt, all datable to the tenth-eleventh century A.D., besides sculptures of Gajalakshmi, Surya, Mahishasuramardini, Durga, Chamunda, Brahma and a few Jaina icons.

39. EARLY HISTORICAL SITE, HUNAKUNDA, DISTRICT KOLAR.—Shri K. K. Ramamurthy of the Temple Survey Project of the Survey noticed an early historical site yielding black-and-red ware and Russet-coated Painted Ware, on the hillock near Siva temple.

MADHYA PRADESH

40. ROCK-PAINTINGS, KATNI AND GOVINDGARH, DISTRICT JABALPUR AND REWA.—Sarvashri S. S. Gupta, J. S. Dubey, O. B. Khobragade and B. K. Rudra of the Prehistory Branch of the Survey studied the paintings in the rock-shelters with a view to finding their relationship with the prehistoric period. Stylistically, the paintings could be divided into three groups each superimposing on the other. While microliths were found in some rock-shelters, others did not contain any occupation deposit. Some of the motifs which are represented in paintings such as shields, swords and wooden palanquin are of very late date. It is not possible to pin-point the exact period of the paintings; probably they represent tribal art of modern days.

41. GUPTA INSCRIPTION, BESNAGAR (VIDISHA), DISTRICT VIDISHA.—The Central Circle of the Survey found a five-lined inscription (pl. XXXIV A) in Brahmi characters of the Gupta period (in Sanskrit language) close to the excavated trenches outside the fortification-wall.

42. SILVER COINS, BIJAMANDAL (VIDISHA), DISTRICT VIDISHA.—Shri B. R. Korde of the Central Circle of the Survey found in the course of general clearance of the site, a hoard of eighty silver coins of the late Mughal rulers (pl. XXXIV B), having legend in Persian.

MAHARASHTRA

43. UPPER PALAEOLITHIC TOOLS, AURANGABAD, DISTRICT AURANGABAD.—Sarvashri S. A. Sali and D. M. Kulkarni of the South-western Circle of the Survey collected Upper Palaeolithic tools from the right bank of the river Kharn 1.0 km upstream of Bibi-ka-Maqbara.

44. MIDDLE PALAEOLITHIC TOOLS, DONGARGAON, DISTRICT AURANGABAD.—Shri D. M. Kulkarni of the South-western Circle of the Survey discovered a Middle Palaeolithic factory site at Dongargaon. The tools collected include discoidal cores, scrapers and points on green basalt, and are comparable to the tools from the Raigad-Ranola Middle Palaeolithic complex of the central Tapti basin.

45. MICROLITHIC SITE, SUDDAGUDAM, DISTRICT CHANDRAPURAM.—Shri D. Subramanian of the Geological Survey, Nagpur, noticed a microlithic site, yielding blades of cherty material showing presence of developed cylindrical core technique, besides other usual tools of the industry (fig. 1 c). The site is situated 3 km south of Umanur quartzite ridge over the Pakhal limestones.

46. MIDDLE PALAEOLITHIC TOOLS, TEKRA, DISTRICT CHANDRAPURAM.—Shri D. Subramanian of the Geological Survey of India, collected rolled Middle Palaeolithic tools from

the bed of the river Pranhita. The tools comprise side scrapers, flake-blades, arrowheads, etc. However, a solitary example of a tanged arrowhead, with the tang being longer than the head, is noteworthy (fig. 1 d-e). The presence of rejuvinating flakes testify the presence of cylindrical cores.

47. MEGALITHIC SITES, DISTRICT NAGPUR.—The Department of Archaeology, Government of Maharashtra, noticed megalithic stone-circles at Dongarmouda, Kuhi, Mandhal, Udasa, Umrer and Wag.

48. MIDDLE PALAEOLITHIC TOOLS, AJNI, DISTRICT NAGPUR.—A few Middle Palaeolithic tools were collected from the bed of a small nullah and the adjoining fields at Ajni by Professor A. M. Shastri of the Department of Ancient Indian History, Culture and Archaeology, University of Nagpur.

49. MIDDLE PALAEOLITHIC TOOLS, MAHURJHARI, DISTRICT NAGPUR.—Professor A. M. Shastri of the Department of Ancient Indian History, Culture and Archaeology, University of Nagpur, collected a few Middle Palaeolithic tools from the bed of a small rivulet flowing on the north of the village.

50. ANCIENT REMAINS, KANDHAR, DISTRICT NANDED.—Dr (Mrs) Shobhana Gokhale of the Deccan College Post-graduate and Research Institute, Pune, noticed remains of foundations of temples, embankments, Nandi-pillars, loose sculptures which corraborate the meritorious building-activities of the Rashtrakuta king Krishna III mentioned in the inscription of this ancient dilapidated city. The inscription refers to the construction of a pavilion *(Sarvalokaraya mandapa),* free feeding house *(Sattrasala),* college *(Vidyasthana), Jagattunga Samudra* named after the Rashtrakuta king Jagattunga Govinda III, the market of the Gujjaras *(Gujjara Apana),* the area where the chief courtesans of the king lived *{Pradhana Rajavilasini pataka)* near Kamadeva temple and temples of Bankesvara, Challesvara, Tumbesvara and Kalapriya. However, the temple of Kalapriya could not be located, but remains of a huge image probably of Kalapriya were noticed. The fragments of the image such as hand (1.21 X 0.95 m), forehead (1.21 X 0.69 m) and foot (1.65 X 0.88 m) suggest that the image was nearly 22 to 23 m in height.

51. JAINA TEMPLE, JAKEKUR, DISTRICT OSMANABAD.—Shri V. L. Dharurkar of the South western Circle of the Survey noticed remains of a Jaina temple and two sculptures of Mahavira in *padmasana.*

52. MIDDLE PALAEOLITHIC TOOLS, DISTRICT YEOTMAL.—Professor A. M. Shastri of the Department of Ancient Indian History, Culture and Archaeology, University of Nagpur, collected Middle Palaeolithic tools from the bed of the river Arunavati at Arani and Bhandari.

53. ANCIENT SITE, ARANI, DISTRICT YEOTMAL.—Professor A. M. Shastri of the Ancient Indian History, Culture and Archaeology, University of Nagpur, noticed an early historical site known as 'Pancha-Pandava Tekdi, yielding black-and-red ware, Northern Black Polished Ware, red polished, red and painted black-on-red wares, remains of structures of baked bricks (size: 58 X 29 X 8/9 cm), die-struck coins and beads of semiprecious stones.

54. TEMPLES AND INSCRIPTION, CHIKANI KASBA, DISTRICT YEOTMAL.—TWO temples, built in Hemadpanti style, loose sculptures, a *garhi* and an inscription, datable to eleventh-twelfth century A.D., were noticed by Professor A. M. Shastri of the Department of Ancient Indian History, Culture and Archaeology, University of Nagpur.

PUNJAB

55. LOWER PALAEOLITHIC SITE, KOTLA, DISTRICT AMBALA.—Shri Lalman of the Department of Geology, Punjab University and Shri Man Mohan Sharma of the Department of Ancient History, Kurukshetra University, discovered an Upper Palaeolithic site on the upper terrace (Terrace I) in the Ghaggar valley at Kotla. The tools include a neatly trimmed pear-shaped Acheulian handaxe, scrapers on flakes, cores and flakes made on quartzite.

RAJASTHAN

56. MIDDLE PALAEOLITHIC TOOLS, POKARAN, DISTRICT JAISALMER.—Shri Devendra Handa of the B.T.T. College, Sardarshahr, collected Middle Palaeolithic tools from a site 2 km north east of Pokaran. The tools collected include scrapers, points, blades, borers, cleavers and flakes.

57. INSCRIPTIONS, OSIAN, DISTRICT JODHPUR.—Shri Devendra Handa of the B.T.T. College, Sardarshahr, noticed a number of inscriptions in Nagari script and corrupt Sanskrit language, datable from *Samvat* 885 to 1882.

58. MEDIEVAL STRUCTURES AND INSCRIPTION, DISTRICT TONK.—Shri R. Pathak of the Western Circle of the Survey discovered a step-well at Hadkala, two mosques, one each _ at Chanduli and Soheli, temples at Sopari and Vamhom and an inscription in Devanagari script dated to A.D. 1832 at Bahom.

TAMIL NADU

59. TERRACOTTA FIGURINE, KADAGATTUR, DISTRICT DHARMAPURI.—Shri Hanumanthappa Telagu of the Southern Circle of the Survey discovered a beautiful terracotta figurine of Kumara (pl. XXXV A), assignable to the ninth-tenth century A.D.

60. NEOLITHS, SCULPTURES AND PAINTINGS, SIYAMANGALAM, DISTRICT NORTH ARCOT.—Sarvashri L. K. Srinivasan and Shivananda of the Southern Circle of the Survey collected fragments of polished stone axes from the slopes of the hill, situated near Avanibhajana Pallava rock-cut temple at Siyamangalam. Besides, a few sherds of coarse red ware were also picked up from the same site. On the northern slopes of the same hill, a natural cavern, which was used by the Jaina monks for habitation, bears traces of painting on the ceiling. On the escarpment of the cavern were noticed bas-relief figures representing Bahubali, Parsvanatha and Mahavira, flanked by Matanga riding an elephant on the one side and Siddayika riding a lion on the other. The Parsvanatha figure is accompanied by the figures of Dharmendra and Padmavati on its right flank (pl. XXXV B). The rock-cut sculptures can be ascribed to eighth-ninth century A.D., on stylistic grounds.

UTTAR PRADESH

61. MEDIEVAL SCULPTURES, FATEHPUR SIKRI, DISTRICT AGRA.—Sarvashri S. K.Jain and C. P. Satsangi of the Northern Circle of the Survey noticed medieval sculptures belonging to Jaina and Hindu pantheon in the vicinity of Fatehpur Sikri. A small sculpture of elephant is noteworthy.

62. JAINA SCULPTURE, TUNDLA, DISTRICT AGRA.—Sarvashri C. B. Mishra and C. P. Singh of the Northern Circle of the Survey noticed an image of Adinatha, datable to *circa* tenth-eleventh century A.D.

63. GUPTA INSCRIPTION, GARHWA FORT (SHEORAJPUR), DISTRICT ALLAHABAD.—Shri D. P. Sinha of the Mid-eastern Circle of the Survey recovered from the debris a buff sand stone slab, inscribed on its two sides in Brahmi characters of the early Gupta times (pl. XXXIV C). This seems to be a part of the inscription collected by General Cunningham from the same site.

64. PALAEOLITHIC TOOLS, ADBADRI, DISTRICT ALMORA.—Shri C. B. Trivedi of the Northern Circle of the Survey collected tools including Levalloisian flakes and scrapers from about 50 m above the present level of the river Narayan Ganga.

65. MEDIEVAL TEMPLES, DISTRICT CHAMOLI.—Shri C. B. Trivedi of the Northern Circle of the Survey noticed a temple consisting of a *garbhagriha of navaratha* plan, crowned by a *sikhara* of Katyuri style, *antarala* and *mahamandapa* at Ukhimatha, and temples at Anusuiya, Gauri Kund, Gupta Kahi and Narayan Koti. Besides a large number of sculptures belonging to Hindu pantheon were noticed at the above-mentioned places. An inscription, dated v.s. 1898, was also noticed at Gauri Kund.

66. INSCRIPTION, GOPESHWAR, DISTRICT CHAMOLI.—Shri C. B. Trivedi of the Northern Circle of the Survey noticed an inscription in shell characters, datable to *circa* sixth century A.D., fixed in the wall of a private house.

67. GUPTA INSCRIPTION, KEDARNATH, DISTRICT CHAMOLI.—Shri C. B. Trivedi of the Northern Circle of the Survey noticed an inscription in Brahmi characters of the Gupta period, besides a few sculptures and architectural members of the same period.

68. MAURYAN LOTUS CAPITAL, AYODHYA, DISTRICT FAIZABAD.—Sarvashri D. P. Sinha and B. S. Jha of the Mid-eastern Circle of the Survey noticed an inverted lotus capital of Mauryan craftsmanship and bearing typical Mauryan polish, installed as *argha* supporting a *Siva-linga* of a later period, in the Nagesvarnath temple at Swarga-dwar in Ayodhya.

69. SCULPTURES, DISTRICT FATEHPUR.—Shri L. M. Wahal of the Northern Circle of the Survey discovered medieval sculptures belonging to Hindu pantheon at Alipur Bhadar, Asothar, Baise, Barrainchi, Chachinda, Chhedani, Karha, Kurari, Moghal Gawa, Naksara, Pai, Salaraha, Sandwa, Sarsibuzurg, Sohadmau, Sultanpur Ghaos and Thithaura. The sculptures noticed include those of Brahma, Vishnu, Siva, Lakshmi-Narayana, Brahma with his consort, Uma-Mahesvara, Siva-Parvati, Harihara, Surya, Gajalakshmi, Durga, Sarasvati, Mahishasura-mardini, Varaha, Ganesa, Kubera, Garuda, Nandi, etc. Besides noticing sculptures of Jaina *tirthankaras* at Asothar and Thithaura, he collected Northern Black Polished Ware, black-slipped, red and glazed wares from Barrainchi, Chachinda, Chhedani, Salaraha and Sultanpur Ghaos. Further, he noticed terracotta figurines of Sunga-Kushana and Gupta periods at Barrainchi and Chachinda.

70. PALAEOLITHIC TOOLS, ADI BADRI AND RUDRAPRAYAGA, DISTRICT GARHWAL.—Shri C. B. Trivedi of the Northern Circle of the Survey collected flake tools made on quartzite, from a site, 3 km upstream from Rudraprayaga and from a site at Adi Badri.

71. GUPTA SCULPTURES, BHITARI, DISTRICT GHAZIPUR.—Shri Krishna Kumar, Registering Officer (Varanasi) of the Department of Archaeology, Government of Uttar Pradesh, noticed a monolithic shrine with Mahishasuramardini, Parvati performing *panchagni-tapas,* Ganesa and Balarama in the four niches, and a *chaitya*-dormer embellished with *Varaha* incarnation

of Vishnu, stylistically ascribable to the sixth century A.D. An *eka-mukha Siva-linga* with *gokarna,* belonging to same period, was also noticed.

72. WATCH-TOWER, DATERI, DISTRICT GHAZIABAD.—Dr Arun Kumar and Sarvashri S. K. Lekhwani and Pramod Singh of the Northern Circle of the Survey noticed a watch-tower, assignable to late medieval period.

73. PAINTED GREY WARE SITE, NARPAT SINGH-KI-GARHI, DISTRICT HARDOI.—Shri R. K. Chaturvedi of the Department of Archaeology, Government of Uttar Pradesh, discovered an ancient site, yielding Painted Grey and Northern Black Polished Wares, terracotta beads, sling balls, terracotta human figurine of Gupta period and a fragment of a sculpture of Vishnu.

74. SCULPTURES, BABINA, DISTRICT JHANSI.—Shri L. M. Wahal of the Northern Circle of the Survey noticed sculptures of Siva, Parvati, Ganesa, Vishnu and *shardula* at Babina.

75. ANCIENT SITE, CHANDNAPUR, DISTRICT KANPUR.—Shri L. M. Wahal of the Northern Circle of the Survey noticed an ancient site yielding Northern Black Polished Ware and terra cotta figurines, assignable to the Sunga-Kushana times and medieval sculptures.

76. PALAEOLITHIC TOOLS, MADANPUR, DISTRICT LALITPUR.—Shri C. B. Trivedi of the Northern Circle of the Survey collected Lower and Middle Palaeolithic tools from the site adjoining the protected monuments known as Chhot and Bari Kachehri.

77. SCULPTURES, DISTRICT MAINPURI.—Shri L. M. Wahal of the Northern Circle of the Survey noticed sculptures of Vishnu, Surya, Uma-Mahesvara, Mahishasuramardini, Harihara, Ardhanarisvara, Ganesa, *navagrahas,* Vidyadhara couples and *sapta-matrikas* at Asouli, Matia-ka-Nagla, Nirawali, Paronkh, Radheypur, Thakhrau, Udaitpur Abai, Ujhiani, besides images of seated Buddha in *dhyana-mudra* and a seated Kunthanath at Udaitpur Abai and Parsvanatha at Asouli. Further, he noticed at Vinayekpur an image of Mahishasuramardini, assignable to the Kushana period, one more sculpture of six-armed Mahishasuramardini and an image of Surya.

78. SCULPTURES, DISTRICT MIRZAPUR.—Shri Krishna Kumar, Registering Officer (Varanasi) of the Department of Archaeology, Government of Uttar Pradesh, noticed at Sultanpur sculptures of Vishnu, Krishna, Vamana and Mahishasuramardini besides a few architectural members, all belonging to *circa* sixth century A.D. Further, he noticed sculptures of Surya, Sadyojata and a fragment of a door-jamb, showing river goddess with a male attendant, all datable to ninth-tenth century A.D. at Chunar Fort in Chunar. At Vindhyachala, he noticed *Siva-lingas* and some badly damaged sculptures belonging to the early medieval period.

79. ANCIENT SITE, ISSOPUR, DISTRICT MUZAFFARNAGAR.—Sarvashri Dhanpat Rai and C. B. Mishra of the Northern Circle of the Survey discovered a site, yielding Painted Grey Ware, black-slipped, grey and red wares, terracotta animal figurines and beads, bangle pieces of copper and steatite, ivory objects and stone beads.

80. ANCIENT SITE, CHAKRA-TIRTHA, DISTRICT SITAPUR.—Dr Arun Kumar and Shri L. M. Wahal of the Northern Circle of the Survey collected, from an exposed section, a few sherds of Ochre-coloured pottery (?), black-slipped ware, Northern Black Polished Ware

and Sunga-Kushana pottery. Besides, a few shrines with domical roof, some medieval sculptures including Harihara and Revanta were also noticed.

81. SCULPTURES, SIDHOLI, DISTRICT SITAPUR.—-Shri L. M. Wahal of the Northern Circle of the Survey noticed architectural members, depicting the images of *sapta-matrikas* and *nava-grahas.*

82. PAINTED GREY WARE SITE, KURWAR, DISTRICT SULTANPUR.—Shri L. M. Wahal of the Northern Circle of the Survey noticed a site yielding Painted Grey Ware, Northern Black Polished Ware, black-slipped, red and glazed wares.

83. NORTHERN BLACK POLISHED WARE SITE, NURPUR, DISTRICT SULTANPUR.—Shri L. M. Wahal of the Northern Circle of the Survey discovered a site yielding Northern Black Polished Ware, black-slipped and red wares.

84. SCULPTURES, AKTHA, DISTRICT VARANASI.—Shri Krishna Kumar, Registering Officer (Varanasi) of the Department of Archaeology, Government of Uttar Pradesh, noticed sculptures representing six-armed mother-goddess feeding two children standing by her side, Hanuman, dancing Ganesa, fragmentary pillars showing *dasavatara* and Krishna-/lila scenes, Brahma-Brahmani, Surya, Durga and Siva, all belonging to the medieval period, as well as *chaitya-dormers* bearing Buddha figures and an eight-armed mother-goddess feeding children belonging to the Gupta period.

85. ROCK-CRYSTAL IMAGE, CHAKIYA, DISTRICT VARANASI.—Shri Krishna Kumar, Registering Officer (Varanasi) of the Department of Archaeology, Government of Uttar Pradesh, noticed in the Police Station at Chakiya a four-armed Vishnu, made of rock-crystal, and pedestal as well as *prabhavali* made of copper, probably belonging to fifteenth-sixteenth century A.D., recovered from the village Sota.

86. SCULPTURES, GYANPUR, DISTRICT VARANASI.—Shri Krishna Kumar, Registering Officer (Varanasi) of the Department of Archaeology, Government of Uttar Pradesh, noticed in the local P.W.D. Rest House a sixteen-armed sculpture of Mahishasuramardini, datable to the tenth-eleventh century A.D.

WEST BENGAL

87. CHALCOLITHIC SITE, POKHARNA, DISTRICT BANKURA.—Sarvashri Sudhin Dey and Dilip Ray of the Department of Archaeology, Government of West Bengal, discovered a chalco lithic site, yielding black-and-red and red wares, on the bank of the river Damodar.

88 CHALCOLITHIC SITES, AMRITBERIA AND ICHHAPUR, DISTRICT MIDNAPORE.—Sarvashri Das Gupta and E. D. Sampson of the Department of Archaeology, Government of West Bengal, along with staff members of the Tamralipta Museum and Research Centre discovered sites, yielding chalcolithic and early historical pottery on the bank of the river Rupnarayan. A number of uninscribed cast coins were also collected from Amritberia.

89 STONE AGE TOOLS, SILDA, DISTRICT MIDNAPORE.—Shri Dilip Kumar Ray and Dr Atul Chandra Bhowmick of the Department of Museology, University of Calcutta, along with the students of museology, collected handaxes, choppers of the Lower Palaeolithic industry,

non-geometric tools of the microlithic industry and neolithic polished stone axes and a pestle from the site situated on the river Tarafani.

90. MICROLITHIC TOOLS, CHANDPARA, DISTRICT MURSHIDABAD.—The Department of Archaeology, Government of West Bengal, collected microliths at Chandpara on the bank of the river Bhagirathi.

91. PREHISTORIC SITE, DEULTANR, DISTRICT PURULIA.—Sarvashri Das Gupta and E. D. Sampson of the Department of Archaeology, Government of West Bengal, collected tools belonging to Lower and Middle Palaeolithic industries and microliths, besides black-and-red ware sherds of coarse fabric from the site on the stream Bandu.

92. EARLY HISTORICAL SITE, MALIARI, DISTRICT 24 PARGANAS.—Shri Das Gupta of the Department of Archaeology, Government of West Bengal, along with the members of the Geological Survey, noticed an ancient site yielding pottery of the Kushana period and later times.

93. SCULPTURES, ISLAMPUR, DISTRICT WEST DINAJPUR.—Shri B. Bandyopadhyay of the Eastern Circle of the Survey noticed medieval sculptures including Vishnu, Uma-Mahesvara and Manasa.

94. MEDIEVAL SITE, ITAHAR, DISTRICT WEST DINAJPUR.—Shri B. Bandyopadhyay of the Eastern Circle of the Survey discovered a medieval site with remains of a brick structure and carved pillars in stone.

V. RADIOCARBON DATES

The Birbal Sahni Institute of Palaeobotany, Lucknow, has set up the C-14 Laboratory, which has this year submitted the following list showing Intercomparison of Radiocarbon Dates between the C-14 Laboratories of the Tata Institute of Fundamental Research, Bombay, and the Birbal Sahni Institute, Lucknow. The dates determined by the Birbal Sahni Institute were based on radiocarbon half-value of 5568 ± 30 years, but have been converted[1] to half-value of 5730 ± 40 years for providing uniformity and for easy reference.

Site and culture	*TIFR dates*	*BSIP dates*
KALIBANGAN (DISTRICT GANGANAGAR, RAJASTHAN)		
Harappa Culture (TF-152)	3723 ±85 (1773 B.C.)	3677±125 (1727 B.C.)
Harappa Culture (TF-149)	3785 ± 140 (1835 B.C.)	3693±121 (1743 B.C.)
Harappa Culture (TF-163)	4027 ±100 (2077 B.C.)	4041 ±127 (2091 B.C.)
Pre-Harappa Culture (TF-156)	3858 ±105 (1908 B.C.)	4132±165 (2182 B.C.)
Pre-Harappa Culture (TF-439)[2]		6702±129 (4752 B.C.)
Pre-Harappa Culture (TF-400)		4129± 99 (2179 B.C.)
TAKALGHAT, (DISTRICT NAGPUR, MAHARASHTRA) Painted Pottery level (TF-784)	2508± 95 (558 B.C.)	2443 ±118 (493 B.C.)
KAYATHA (DISTRICT UJJAIN, MADHYA PRADESH) Chalcolithic Culture (TF-777)	3734± 95 (1784 B.C.)	3593 ±127 (1643 B.C.)
INAMGAON (DISTRICT PUNE, MAHARASHTRA) Chalcolithic Culture (TF-923)	2977±170 (1027 B.C.)	2939 ± 149 (989 B.C.)
PAIYAMPALLI (DISTRICT NORTH ARGOT, TAMIL NADU) Neolithic Culture (?) (TF-829)	1015±105 (A.D. 935)	1162± 98 (A.D. 788)

[1]Editorial Statement, *Radiocarbon,* vol. 5-1963

[2]The date of TF-439 seems to push the antiquity of KLB-2 back by nearly two thousand years. The sample was counted twice and the date can be relied upon.

Radiocarbon dates[1] presented in the following pages were determined at the Physical Research Laboratory, Ahmadabad (between August 1977 and June 1978) and the Birbal Sahni Institute of Palaeobotany, Lucknow. The dates are based on radiocarbon half-value of 5730 ± 40 years. For conversion into B.C./A.D. scale, 1950 is the base year. The sites[2] are arranged Statewise and alphabetically. All the samples were pre-treated with hydrochloric acid. Rootlets were handpicked, wherever present.

HARYANA

1. TILAPAT, DISTRICT GURGAON

BS-15. Historical level; decaying timber of *Adamsonia digitata* tree from the site connected with *Mahabharata* epic.	300 ± 155 (A.D, 1650)

MADHYA PRADESH

2. BESNAGAR, DISTRICT VIDISHA

PRL-282. NBP deposit; charcoal; locus: trench VI, layer 11; depth 4-10 m; sample no. 1.	2270 ± 150 (320 B.C.)

MAHARASHTRA

3. DAIMABAD, DISTRICT AHMADNAGAR

PRL-412. Chalcolithic deposit; charcoal; locus: trench EZ64, layer 8; depth 1-7 m; sample no. DMD/3/1976-77.	3340 ± 120 (1390 B.C.)
PRL-441. Chalcolithic deposit; charcoal; locus: trench FZ64, layer 7; depth 1-6 m; sample no. DMD/2/1976-77.	3321 ± 100 (1370 B.C.)

4. APEGAON, DISTRICT AURANGABAD

PRL-382. Chalcolithic deposit; charcoal; locus: trench XII-XVI, layer 4; depth 1-3 m.	3550 ± 110 (1600 B.C.)

[1]Contributed by Dr D. P. Agrawal, Shri R. V. Krishnamurthy, Kumari Sheela Kusumgar and Dr R. K. Pant of the PRL (Item nos. 2-6 and 8-11) and Sarvashri G. Rajagopalan and B. Sekar of the BSIP (Item nos. 1 and 7). For further details of the sample, the submitting organizations may be contacted.

[2]Samples submitted by: 1, Forest Research Institute, Dehra Dun; 2, 3, 9-10, the Archaeological Survey of India; 4, 5 the Deccan College Post-graduate and Research Institute, Pune; 6, the Geological Survey of India; 7, the Department of Ancient History and Archaeology, University of Madras; 8, the Allahabad University, Allahabad; and 11, the Garhwal University, Srinagar.

PRL-383. Chalcolithic deposit; charcoal; locus: trench XII-XVI, layer 5; depth 1.5 m.	3550±110 (1600 B.C.)
PRL-384. Chalcolithic deposit; charcoal; locus: trench XII-XVI, layer 6.	3630±110 (1680 B.C.)

5. PUNE, DISTRICT PUNE

PRL-380. Late historical deposit; elephant bone under lying a 2-m thick nullah deposit; sample no.1.	Modern

RAJASTHAN

6. ZAWAR, DISTRICT UDAIPUR

PRL-293. Lead workings; carbon from lead smelting clay retort.	Modern

TAMIL NADU

7. APPUKALLU, DISTRICT NORTH ARCOT

BS-38. Megalithic culture; charcoal; locus: APKL-1, southern section, pit sealed by layer 12.	2300 + 140 (350 B.C.)

UTTAR PRADESH

8. MAHAGARA, DISTRICT ALLAHABAD

PRL-407. Neolithic deposit; charcoal; locus: trench MGR-6/7, XXXVI-XXXVIII, pit sealed by layer 17; depth 2-4 to 2-6 m; sample no. AU/ALLD/MGR-77/1.	3390+100 (1440 B.C.)
PRL-408. Neolithic deposit; charcoal; locus: trench MGR-6/7, XXXIX-XL, layer 12; depth 1-2 to 1-3 m; sample no. AU/ALLD/MGR-77/2.	3280±120 (1330 B.C.)
PRL-409. Neolithic deposit; charcoal; locus: trench MGR-6/7, XXXIX-XL, layer F/H 13 sealed by 8; depth 1-1 m; sample no. AU/ALLD/MGR-77/3.	3350+150 (1400 B.C.)

9. GANWARIA, DISTRICT BASTI

PRL-325. PGW deposit; charcoal; locus: trench XA1, Qd. 2, Room 17, layer 15; depth 7 m; sample no. 15.	4740±110 (2790 B.C.)

10. AYODHYA, DISTRICT FAIZABAD

PRL-452. Early historical deposit; charcoal; locus: trench AYD-6, sector A-C, layer 11; depth 4.6 m; sample no. CH.S. no. 1.	2250±100 (300 B.C.)
PRL-462. Early historical deposit; charcoal; locus: trench AYD-7, sector H-J, layer 8; depth 4.5 m; sample no. 130.	2050±90 (100 B.C.)
PRL-466. Early historical deposit; charcoal; locus: trench AYD-5, Sq. Cl, Qd. 1, pit sealed by layer 12; depth 4-5 m; sample no. 1251.	2130±100 (180 B.C.)
PRL-467. Early historical deposit; charcoal; locus: trench AYD-5, Sq. Cl, layer 13; depth 4-4 m; sample no. 1252.	1960±90 (10 B.C.)

11. RANIHAT, DISTRICT TEHRI GARHWAL

PRL-392. Early historical deposit; charcoal; locus: trench RNT-1, IV-VI, layer 10; depth 3.1 m; sample no. RNT-1, S-5.	1690±140 (A.D. 260)
PRL-394. Early historical deposit; charcoal; locus: trench RNT-1, IV-VI, layer 8 depth 2.7 m; sample no. RNT-1, S-3.	1570±140 (A.D. 300)

VI. PALAEOBOTANICAL AND POLLEN ANALYTICAL INVESTIGATIONS[1]

The present report incorporates the work done on the subject both at the Birbal Sahni Institute of Palaeobotany, Lucknow (below: 1-3 and 7-13), and the Deccan College Post-graduate and Research Institute, Pune (below: 4-6).

SAMPLES FROM INDIA

ANDHRA PRADESH

1. PEDDABANKUR, DISTRICT KARIMNAGAR.—Five samples of charcoal, collected from different depths, which were earlier *(1976-77,* p. 90) examined preliminarily, have now been processed following the usual methods of dehydration, infiltration, clearing and embedding in paraffin wax. The blocks are now being prepared for sectioning.

GUJARAT

2. PRABHAS PATAN, DISTRICT JUNAGADH.—The carbonized food grains, earlier identified as *Phaseolus vulgaris (1976-77,* p. 90), on detailed morphological examination are now identified as of *Dolichos* cf. *lab-lab.* Seeds of *Pisum sativum* have also been noticed in the collection. There are only two seeds *of Pisum* in the collection and the rest are of *Dolichos.* The carbonized seeds of both *Dolichos* cf. *lab-lab* and *Pisum sativum* exhibit slight reduction in size due to carbonization.

KARNATAKA

3. HUNSGI, DISTRICT GULBARGA.—Only three samples out of eight, collected from the Acheulian camp-site, yielded pollen which is highly insufficient. In view of the few pollen grains recovered per sample, no reliable inference could be drawn, and possibly the pollen grains may be contaminated. Nevertheless the number of pollen count per sample was raised to 100 or over 100 by counting several slides, the percentages calculated reveal the non-forested savannah. No reliance can be attached to these observations.

The samples were collected by Dr K. Paddayya of the Deccan College Post-graduate and Research Institute, Pune.

MAHARASHTRA

4. DAIMABAD, DISTRICT AHMEDNAGAR.—In the samples collected from various cultural horizons, from bottom to top, such as Savalda, late Harappa, buff and cream ware, Malwa and Jorwe, ranging in age from *circa* 2200 to 1000 B.C., following grains could be identified.

Wheat *(Triticum* sp.), Barley *(Hordeum vulgare* Linn.), Finger millet or African millet *(Eleusine coracana* Linn.), Lentil *(Lens esculenta* Moench.), Common pea *(Pisum arvense Linn.),* Grass pea *(Lathyrus sativus* Linn.), Horse gram *(Dolichos biflorus* Linn.), Hyacinth bean *{Dolichos lab-lab* Linn.) and Indian jujube *(Zizyphus jujube* Lamk.).

The samples were collected by Shri M. D. Kajale of the Deccan College Post-graduate and Research Institute, Pune.

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[1] Contributed by Dr Vishnu Mittre and Srimati Savithri Ravi of the Birbal Sahni Institute of Palaeobotany, Lucknow and Shri VI. D. Kajale of the Deccan College Post-graduate and Research Institute, Pune.

5. NAIKUND, DISTRICT NAGPUR.—Carbonized grains of Wheat *{Triticum* sp.), Lentil *{Lens esculenta* Moench.), Black gram *(Phaseolus mungo* Linn.), Common pea *(Pisum arvense* Linn.) and Indian jujube *(Zizyphus jujube* Lamk.) were recovered from the megalithic occupation, tentatively assigned to 700-600 B.C., on cultural grounds. The present discovery of these grains bridges the gap in the history of these individual crops from the chalcolithic to the early historical times.

The samples were collected by Shri M. D. Kajale of the Deccan College Post-graduate and Research Institute, Pune.

6. INAMGAON, DISTRICT PUNE.—Evidence of wild as well as cultivated grains could be obtained from Malwa, Early Jorwe and Late Jorwe cultural phases, ranging in age from 1600-700 B.C. The grain assemblage includes following species: Wheat_ *(Triticum* sp.), Barley *(Hordeum vulgare* Linn.), Kodo millet *(Paspalum scrobiculatum* Linn.), Finger millet or African millet *(Eleusine coracana* Linn.), Lentil *(Lens esculenta* Moench.), Common pea *(Pisum arvense* Linn.), Hyacinth bean *(Dolichos biflorus* Linn.), Black gram/Green gram *(Phaseolus mungo* Linn./*Phaseolus aureus* Roxb.), Grass pea *(Lathyrus sativus* Linn.), Beheda *(Terminalia belerica* Roxb.), Jambolan plum *(Syzigium cumini* Linn.) and *Abutilon* sp. In addition several grains of wild grasses could also be recovered. Their botanical identification is in progress.

The samples were collected by Shri M. D. Kajale of the Deccan College Post-graduate and Research Institute, Pune.

RAJASTHAN

7. BUDHA PUSHKAR, DISTRICT AJMER.—A sample (BS-80) of buried fossil oxidized layer, about 5 m to 8 m below sand dune and close to the lake, has been dated to 825 ± 115 B.P. The botanical analysis of the sample has given indications that the oxidized layer was deposited under lacustrine conditions. Although pollen is insufficient in the sample and not reliable on that account, yet it abounds in grass pollen, species of saline habitat and a desert species. There is further evidence of putrefying fungi which may have destroyed much of the organic matter in it.

No tools were found associated with this layer, as reported earlier by Andrew Goudie, Bridget Allchin and K.T.M. Hegde (1973), on the basis of which they dated the layer to mid-Upper Palaeolithic period. The radiocarbon of the deposits, however, does not corroborate. Further investigation is in progress.

8. KALIBANGAN, DISTRICT GANGANAGAR.—TWO samples of charcoal, dated by C-14 method were also examined for palaeobotanical studies. The charcoal BS-49 has been identified as *of Ficus* sp. and BS-46 as that *of Calliqonum* sp. cf. *C. polygonoides.* Both the plants occur in the Rajasthan desert.

TAMIL NADU

9. MALAPPADI, DISTRICT DHARMAPURI.—The sample consisting of husks which was collected from the heap encountered at a depth of 55 cm under a boulder in the trench, just above the bottom layers, belongs to rice (0. *sativa).* Some husks compare with those of *Setaria* sp. Possibility of other millets cannot be overlooked.

Another sample from this site (MDP-3, locus: VII-VIII; stratum: pit 2 sealed by dumpl ; depth: 69 cm) consists of very small pieces of charcoal embedded in clay mass. Since the charcoal pieces are very small in size, damp and brittle, it is not possible to process and section them.

10. APPUKALLU, DISTRICT NORTH ARGOT.—Among the two samples of charcoal (APKL-1; Locus: O-O'; stratum 12; depth 3.85-4.20 m; and Locus: III-IV; stratum 9; depth 2.85 m), dated to the beginning of the Christian era and to the third-fourth century A.D. respectively, only a few charcoal pieces were processed and embedded in paraffin wax and the blocks kept ready for sectioning.

A small piece of drainage pipe, about 15 cm in length and 10 cm in diameter which was recovered from APKL-1, locus II-IV', at a depth of 98 cm, on examination after breaking it open, did not reveal any plant remains or their impressions.

11. GUDAVANCHERI, DISTRIGT CHINGLEPUT.—Detailed and critical analysis of the impressions and compressions of rice embedded in the urns collected from the site indicated that the rice can be identified as of 0. *nivara-the* annual wild rice.

The sample was collected by Shri J. Roper-Evans and handed over to the Head of the Department of Ancient Indian History and Archaeology, Madras University.

12. ADICHCHANALLUR, DISTRICT TIRUNELVELI.—An urn recovered from the site, when split open and examined, revealed impressions and compressions of rice which after critical analysis was identified as of rice (0. *sativa).*

SAMPLES FROM ABROAD

NEPAL

13. LUMBINI, DISTRICT TAULIHAWA.—Charcoal pieces recovered from the site LMBN-1 (Locus: K-21, 121; Qd. 3; stratum: pit sealed by layer 8; depth 2.0 m) and charcoal found mixed with charred human bones from LMBN-1 (Locus: K-20, 2s-l; stratum: fragmented burial) and charcoal from LMBN-1 (Locus: H-21, J-2; layer 7; depth: 1.40 m) and charcoal from LMBN-1 (Locus: K-21, L-21; stratum: pit sealed by layer 8; depth: 2.0 m) and charcoal from LMBN-K 20, 22 (Locus-L; layer 7; depth: 1.20 m) have been sorted out, processed and embedded in paraffin wax and blocks prepared for sectioning, after preliminary examination.

VII. MUSEUMS

1. TAJ MUSEUM, AGRA.—The antiquities associated with the history of the Taj and its builder are being exhibited in a museum which will shortly be thrown open to the public (pl . XXXVI A).

2. STATE MUSEUM, BHAGALPUR.—Thirty-two sculptured and architectural pieces of the Pala period were obtained through the Registering Officer, Bhagalpur. Notable amongst these are: Varaha, Vishnu, panel depicting Buddha, Ganesa, Sarasvati and Uma-Mahesvara from the Vice-Chancellor, Mandar Vidyapitha; unidentified female figure from Shrimati Mukta Sarkar; Vishnu and Sarasvati from Sabbalpur Gram Panchayat; and a monolithic column from Shri Chand Mishra.

3. ORISSA STATE MUSEUM, BHUBANESWAR.—The newly-acquired exhibits include five antiquities for the Archaeology Section, four objects for Natural History, twenty-six for Art and Craft, besides one hundred and twenty-five palm-leaf manuscripts, including five illustrated ones and a number of anthropological specimens. A personnalia gallery in the name of Utkalmani Pandit Gopabandhu Das is being set up; it includes a life-size bust in bronze, an oil painting, three murals and a number of photographs showing his different activities apart from a diorama showing Gopabandhu during a devastating flood.

4. ARCHAEOLOGICAL MUSEUM, BODH GAYA.—In the main hall were displayed uprights and cross-bars of the Sunga period, and two sculptures, one of Varaha and the other of Trivikrama, both datable to the eleventh century, were added to the exhibited objects.

5. PRINCE OF WALES MUSEUM, BOMBAY.—Because of the major repairs to the dome and the building the Museum had to be closed down for public from April to September 77. As a result, over three thousand antiquities were removed for safe custody and these were reinstalled after the completion of the work. This stupendous task could be accomplished with the financial assistance of the Government of India and the Government of Maharashtra, the entire repair-work being supervised by Shri J. G. Bodhe, an eminent Architect and Structural Engineer, and also a Trustee of the Museum. The Museum was reopened to the public on 16 October 1977 when the new gallery for Indian prehistory and protohistory, besides a gallery of Assyrian reliefs, was inaugurated.

The Museum put up two major exhibitions: 'Animal in Indian Art' from 1.10.77 to 21.10.77 to coincide with the Wild Life Week celebrated by the World Life Fund and 'Recent Finds of the Indus Civilization', the latter in collaboration with the Archaeological Survey of India.

Noteworthy additions to the Museum collection are: stamped terracotta from Harwan (Kashmir Valley) dated to the fourth-fifth century A.D. on long-term loan from Archaeological Survey of India; bronze images, one of Vishnu and other of Lakshmi, gifted by the Inspector of Police, Central Railway, Bombay; and a stone figure of Parsvanatha (A.D. 1150) gifted by the Assistant Commissioner of Police, Bombay.

6. ASUTOSH MUSEUM OF INDIAN ART, CALCUTTA.—The Museum added about fifty pieces of art and antiquity during the period under review. Collections in the Districts of 24 Parganas, Midnapore, Murshidabad, Birbhum of West Bengal comprised interesting terracottas, painted clay dolls and toys, scroll paintings, painted bowls and puppets of traditional character. Amongst

the new additions figure: a wooden architectural member bearing scenes from the *Ramayana* and Krishna-/z7a from Orissa; embroidered cotton wall-hanging with traditional motifs from Vadodara, Gujarat; pottery and brick-fragments of the chalcolithic and early historic times respectively from Devnimori and Kanewal in Gujarat; and bamboo and reed work of tribal character from Manipur. The work of documentation of museum-exhibits made appreciable progress.

7. INDIAN MUSEUM, CALCUTTA.—During the year a new gallery of 'Minor Art, Historical Period' was formally thrown open to the public (pl. XXXVI B). Terracotta objects ranging in dates from the pre-Mauryan to post-Gupta times, variously from Taxila, Kurukshetra, Ahichchhatra, Bhita, Kausambi and other places are displayed here (pl. XXXVII A).

The collections of the different Section are enriched by the addition of several new objects, of which one Gandhara sculpture, an art piece from Central Asia, a Nepalese coin and two tokens in addition to eleven architectural and sculptured pieces of *circa* tenth to twelfth century A.D., from Bihar, Madhya Pradesh and western India, worth special mention.

The Archaeological Section organized an exhibition on Buddha and Buddhism from 16 to 31 May 1977 at the time of the Buddha Jayanti. An exhibition on sculptures of Pala-Sena Art was set up by the same Section on the occasion of the seminar of the Pala-Sena Art organized by the Centre of Advanced Study in Ancient Indian History and Culture.

In collaboration with the Archaeological Survey of India and Calcutta Customs, the Museum organized an exhibition of confiscated antiquities, the first of its kind in India.

8. STATE ARCHAEOLOGICAL GALLERY, CALCUTTA.—New additions to the Gallery attached to the State Department of Archaeology, West Bengal, include images of Jaina *tirthankaras,* from Deulbhira, District Bankura, ascribable to the ninth-tenth century A.D., a fragmentary tenth-century stone sculpture of Mahishasuramardini from Maliari, District 24 Parganas, a four-armed image of Vishnu in black basalt, at a place in Haroa P.S., District 24 Parganas and a small Siva-/z»ga, in jade, datable to the medieval times, from Wari under Harishchandrapur P.S. in District Malda.

9. CHANDRADHARI MUSEUM, DARBHANGA.—The Rajnagar bronze gallery was reorganized and eight small Buddhist bronze images have been added to the collection.

10. MAHARAJADHIRAJA LAKSHMISHWAR SINGH MUSEUM, DARBHANGA. —The Museum has been started in the old Government House. Six galleries have been arranged and in a new gallery i.e. Darbar hall, Maharaja's throne, gold and silver-worked chairs are being displayed.

In connexion with the Museums Week celebration an exhibition was organized in which old armours served as the best attraction to the visitors, specially children.

11. ASSAM STATE MUSEUM, GAUHATI.—The Museum is enriched by the collection of seventeen miniature metal-images found in a hoard at Hahara, near Sonapur, District Kamrup, a hoard of Muslim silver coins from Rudresvara, north Gauhati, a stone image of Vishnu from Khana-Medhipara, near Dudhnoi, District Goalpara, a fragmentary sculpture from Mikirati, District Nowgong, and a small brass image of Lakshminarayana at a place near Moran. Of the seventeen icons in the first-mentioned hoard, two are of Vishnu, one of Surya, two of Mahishamardini, two of Kali, two of Ganesa, one of Garuda, one of Gajalakshmi, two of Siva-*lingas,* the remaining ones being unidentified images. But for one, which is unidentified and with Pala traits of the tenth century A.D., all these metal images belong to the Ahom period. A unique

image of Manasa, with elephant as the vehicle, was compulsorily acquired and is on display in the Museum.

12. GAYA MUSEUM, GAYA.—The Museum acquired stone images variously of Lakulisa, Siva, Parvati, Chamunda and Surya, ascribable to the Pala period, through the efforts of the Registering Officer, Gaya. Twenty-two metal utensils dug out at Kothwara, Sherghati Block, District Gaya, have also been brought to the Museum.

13. ARCHAEOLOGICAL MUSEUM, HALEBID.—Noteworthy amongst the twenty-seven sculptures acquired from the ruined Hoysala temple of Nagaresvara are the images of Uma-Mahesvara, Lakshminarayana, Nataraja, Parvati, Sarasvati (pl. XXXVIII A), Trimurti (pi. XXXVIII B), Bhairavi (pl. XXXVIII C), Kala-Bhairava, Kesava and dancing Ganesa.

14. STATE MUSEUM, HYDERABAD.—The Museum acquired a rich collection of Megalithic pottery from Bethole in Huzurnagar Taluk, while in the exploration at Kolanupaka were discovered a beautiful *linga* with *yonipitha,* and a torso of Vajrapani. Two copper-plate grants issued by the king Anantavarma of the Eastern Gangas and his feudatory, four Persian paintings with couplets from *Rubayat* of Omar Khayyam, and *Shah Nama* of Firdausi, besides a good number of contemporary paintings, were purchased. A collection of objects of the Swat valley culture consisting of stucco figures of Buddha and Avalokitesvara was presented to the Museum by Shri N. V. Rao. The Museum acquired a palm-leaf manuscript of the *Mahabharata* with sixteen *parvas* and a complete set of *Harivamsa.* Furthermore, a model of the Amaravati stupa was displayed in the Amaravati Gallery.

During the year, the Museum participated in the Museums Week celebration. Arrangement is being made for introducing shortly a mobile museum for a photographic exhibition to be taken to the interiors of Andhra Pradesh.

15. ARCHAEOLOGICAL MUSEUM, KHAJURAHO.—Eighty-six sculptures and architectural fragments of about the tenth-eleventh century A.D. recovered from a nearby temple-complex have been added to the existing collection.

16. STATE MUSEUM, LUCKNOW.—The Museum obtained a number of important antiquities, of which the following are noteworthy: seated *yaksha* figure (pl. XXXIX A), of the first-second century A.D., from Kausambi; a clay-mould of grape, of the Sunga period; a Sunga terracotta plaque with two female figures shown up to bust, from Allahabad; a terracotta plaque showing a female figure with parrot, of the Kushana period; head (pl. XXXIX B) from Hulasikhera, Mohanlalganj, Lucknow; and a clay seal (pl. XXXVII B) showing a seated male figure with a bull to his left, and the legend *bhattaraka duhitu mahadiavaya* in the characters of the second century B.C.

17. ARCHAEOLOGICAL MUSEUM, FORT SAINT GEORGE, MADRAS.—'The Wadeyar Gallery' highlighting the cultural traits of the last two centuries in the Mysore area was thrown open to the public. Some porcelain plates and documents belonging to the East India Company and a copper-plate of Napoleon III commemorating a statue of Dupleix at Pondicherry have been obtained. Moreover, twelve Indo-French coins and a porcelain dish of an Arcot Nawwab are added to the collection.

18. GOVERNMENT MUSEUM, MADRAS.—During the period under review the Museum acquired a good number of antiquities under the Treasure-trove Act 1878 from different parts of Tamil Nadu. Most of the objects are metal-images, the largest collection of sixteen coming

from Uthumalai, Tenkasi Taluk of District Tirunelveli. An inscribed slab with Tamil inscription was presented to the Museum by the Executive Officer, Arulmigu Subrahmanyasvami Devasthanam, Tiruttani. The Museum purchased three contemporary paintings and two paintings in batik.

Seven cases of the Metal Ware Gallery were painted with pleasing background and the exhibits re-displayed. The stucco heads presented by Shri K. Ramamurthi are on show in the New Extension Gallery. In the Bronze Gallery are displayed for the first time the images of Sorakkudi Somaskanda, Tiruvengimalai Parvati with an attendant, Tirukkodikkaval Mahesvari etc.

An exhibition and a seminar were organized in August in connection with the birth centenary of Ananda K. Coomaraswamy.

19. GOVERNMENT MUSEUM, MATHURA.—The Museum collection is further enriched by the acquisition of thirty-seven sculptures and a terracotta, of which the following deserve special mention: bust of a female deity in red sandstone of the Gupta period; a large-size standing Saivite image in red sandstone (pl. XL A), of the Kushana period; pedestal of a Buddha-image with a four-line inscription (pl. XL B), dated to A.D. 106, from Govind Nagar, the epigraph referring the image as that of Amitabha Buddha, installed by Naga-rakshita, son of Buddha-bala and grandson of trader Bala-kirti; bust of a *yaksha* Kushana period (pl. XXXVII C); and a beautiful statue of Vishnu in his Vamana incarnation (pl. XL C), flanked on either side by *chakra-purusha* and *sankha-purusha* of the medieval period.

An exhibition of antiquities from Sonkh was organized in the National Museum, New Delhi, and in the Mathura Museum. The Museums Week coincided with the celebration of the birth centenary of Ananda K. Coomaraswamy when the new revised edition of the guidebook, *Mathura Museum and Art* was released. A Special pavilion was set up in the Sardotsava exhibition at Agra.

Some changes were introduced in the gallery and at places mosaic floor was provided to protect sculptures from dampness.

20. ARCHAEOLOGICAL MUSEUM, NALANDA.—Gallery 1 displaying terracotta, stucco, seal and sealing besides three important inscriptions, and Gallery 2 exhibiting smaller sculptures, have now been fully reorganized.

21. NATIONAL MUSEUM, NEW DELHI.—During the year 1977-78 the Museum purchased eighty-one bronzes, fifty-eight sculptures, forty-six terracottas, three seals, two beads and one jeweller's mould. About eleven sculptures were given by the Archaeological Survey of India on long term loan of fifty years; of these, the Sunga sculpture of Naga Muchalinda [pl. XLI A) from Pauni, Siva as Vamana of the Vakataka times from Mansar, Ganga of the Rashtrakuta period from Ellora, Harihara in the Western Chalukyan style from Badami, bearded head (pl. XLI B) in Pratihara style from Mandor and *flying yaksha* of the Indo-Portuguese tradition may be mentioned in particular. A bronze image of seated Jina was gifted by the Civil Court, Surat, while ten stone sculptures (pl. XLI C) were received from the Sagar University Museum in exchange of art objects.

An exhibition of Indian Miniature Paintings was taken to USSR under the Indo-USSR Cultural Exchange Programme. The exhibition was held both at Moscow and Leningrad. A new exhibition of Indian Miniature paintings representing different schools and sub-schools was set up in a permanent gallery replacing the earlier Coomaraswamy Centenary exhibition.

A regular schedule of gallery talks by sectional and departmental heads was instituted during the year. This year's extension lectures were delivered by Professor Niharranjan Ray on

'What is Classical in Indian Art.' Several other lectures were organized in the Museum auditorium.

Under the scheme 'Propagation of Culture amongst students in Schools and Colleges', one hundred and fifty educational and cultural kits were produced on the plastic arts and distributed to such educational institutions from where teachers had been deputed to the Orientation Course. The Ninth Short Term In-service Course in Museology was held this year in January to February 1978.

The Mobile Exhibition van mounted the exhibition 'Architects of India's Glory' and visited a number of schools and colleges. At each place selected films on Indian art and culture were screened.

22. STATE MUSEUM, PATNA.—A gold bead, two minute fragments from Katragarh, District Muzaffarpur and a votive stupa, presented by Shri A.K. Saran of Patna are new additions to the Museum's collection.

23. HIMACHAL STATE MUSEUM, SIMLA.—The Museum obtained through purchase, exploration, gifts or loan forty-five Indian miniature paintings, twenty-two stone sculptures, five wood-carvings, ten bronzes, seven hundred and one silver and copper coins, three gold coins and thirty-four ethnographical objects. Fourteen sculptures from Sirmuri-Tal, ancient capital of Sirmur State and several others from Nirmand, a village of great archaeological importance in the Sutlej vallev were collected. Sculptures from Nirmand range in dates from the sixth century A.D. to the late medieval times. A sculpture showing three faces of Siva and another of Ganga from the Kangra fort have been received on loan from the Archaeological Survey of India. The new coin-collection includes, apart from local, Tibetan and Muslim coins, issues belonging to the Indo-Greeks, Kunindas, Kushanas, etc.

24. ARCHAEOLOGICAL MUSEUM, SRIRANGAPATNA.—The Museum acquired a Persian manuscript of *Rishal-i-Jihad,* running to three hundred pages. It is supposed to have been written under the direction of Tipu Sultan and deals with the regulations, disciplines, strategies of war, issue of war communique and directions to commanders. In a separate gallery have been displayed the dress, sword and other personal belongings of Tipu Sultan. A map showing the different mints of this period is added and specially-designed showcases have been introduced for the display of coins.

25. BHARAT KALA BHAVAN, VARANASI.—During the period under review the Museum acquired five hundred and six coins, one hundred and seventy-five paintings belonging variously of Marwar, Mewar and Nepal Schools, some illustrated palm-leaf manuscripts of Orissa, Buddhist as well as south Indian manuscripts and one hundred and seven sculptures variously of stone, metal and terracotta. Of the total number of fifteen textile pieces, the majority are the donations bv Dr Rajwade of Gwalior. Some of the sculptures like taming of Nalagiri (first centurv A.D.). from Amaravati, Ekamukha-*linga* from Rajghat, an early Gupta piece, Siva-mask in metal from Chamba and a four-armed Siva of the tenth century were gifted by Shri Kejariwal, Krishnamurti foundation (Varanasi). Shri C. L. Bharani and Shrimati Pupul Jayakar respectively.

Dr R. V. Sithole's coin-collection, most of the specimens being in mint-condition, was donated to the Museum and it includes silver bent-bar and cup-shaped punch marked coins, and silver coins of different States. Other important coins collected for the Museum are Indo-Greek coins, Muslim coins, gold coins of Huvishka, Kumaragupta, Shah Jahan, etc. A rare eight-anna silver coin of Zodaic Taurus and one-rupee coin with Zodaic sign Cancer were also collected.

VIII. ARCHITECTURAL SURVEY OF TEMPLES

NORTHERN REGION.—The Temple Survey Project, Northern Region, under Shri R. D. Trivedi, took up the survey of the temples of Pratiharas in the region around Gwalior and Vidisha. As a preliminary survey, the temples at Badoh-Pathari and Gyaraspur, in District Vidisha, Gwalior Fort and Amrol in District Gwalior, Naresar and Batesara in District Morena, Deogarh in District Lalitpur, were taken up for study. The study of temples at Naresar and Batesara seems to suggest that some of the temples at these places may represent a phase of the Pratihara architecture, datable to the eighth century A.D. On the other hand, the Gadarmal temple at Badoh-Pathari and Maladevi temple at Gyaraspur would seem to belong to the later phase, assignable to the ninth century A.D.

The group of temples at Batesara, situated in the thick forest near Padhaoli, also contains a tank with flights of steps on all sides. The main temple, which is still under worship, illustrates the characteristics of this architectural style (pl. XLII A). The *adhishthana* of the temple consists of bold *kumbha, kalasa* and *kapotika* mouldings, while the *jangha* displays the figures of Ganesa, Karttikeya, and Parvati in the *bhadra* niches and *ashtadikpalas* on the *karna* niches. The *sikhara* with its double *venukosa* flanking the cardinal *madhyalatas* has a prominent *sukanasika* whose embellished *chaitya* face carries the carved figure of Lakulisa. One of the small shrines on the eastern side of the tank shows a sculpture of the Kalyanasundara form of Siva (pl. XLIII A).

The Naresar group (pl. XLII B and fig. 10) depicts a relatively earlier phase of architecture, compared to Batesara. The *garbhagriha* is approached through a *tri-sakha* doorway for its narrower *antarala* (antechamber). The *adhishthana* mouldings consist of plain *kumbha, kalasa* and *kapotika,* followed by a plain *jangha* relieved by *bhadra* niches on its three faces. The *sikhara,* divided into three *bhumis* by *karnamalakas,* is surmounted by a larger *amalaka* and provided with a *sukanasika* with a prominant *chaitya* dormer. Another temple (no. 20 of this group) is distinguished by its rectangular plan and inverted boat-shape *(valabhi)* or *potakara sikhara,* seemingly anterior to the Teli-ka-Mandir within Gwalior Fort. Consistent with its rectangular plan, it bears two *bhadra* niches on its back wall. Another temple (no. 16) is evidently later by its plan and elevation, apart from the evolved mouldings of its *adhishthana* and a more embellished doorway. The architectural activity at the site would fall between the early eighth century and the twelfth century A.D.

About 3 km east of Deogarh, District Lalitpur, lies an unusual temple, known as Kuraiya Bir Temple (pl. XLIII B) carrying a large window on each of the cardinal sides with a pillar scheme supporting a *rekha-sikhara* in three *bhumis.* The pillars and pilasters of the *mukha-mandapa and jangha* portion display ornate *ghatapallava* motif and surmounted on the prominant *bhadra* niches of the main shrine wall are elongated *udgamas* of *jalaka* pattern. In the rear *bhadra* niche, a mutilated figure of Karttikeya seated on peacock is still in position.

An initial survey of a few Paramara temples at Udaipur, District Vidisha, Un and Onkar-Mandhata, Districts West and East Nimar, Bhojpur, District Raisen was also conducted, besides a study of the temples at Sanchi, District Raisen, Udaigiri, District Vidisha, Bhitargaon, District Kanpur, Chandpur, District Lalitpur and Padhaoli and Mitaoli, District Morena.

SOUTHERN REGION.—The Temple Survey Project, Southern Region, under Shri I. K. Sarma, assisted by Shri K. K. Ramamurthy, conducted the survey of the temples in the regions ruled by the Western Gangas. Preliminary study has indicated that the architectural vestiges of this dynasty have been greatly influenced at various stages by the art-idioms and influences of the contemporary kingdoms of the Pallavas, Chalukyas, Rashtra-kutas, Nolambas and Cholas, particularly in the present Bangalore, Mysore and Kolar tracts. The line of the Gangas, starting perhaps in the late fourth century A.D., had extended up

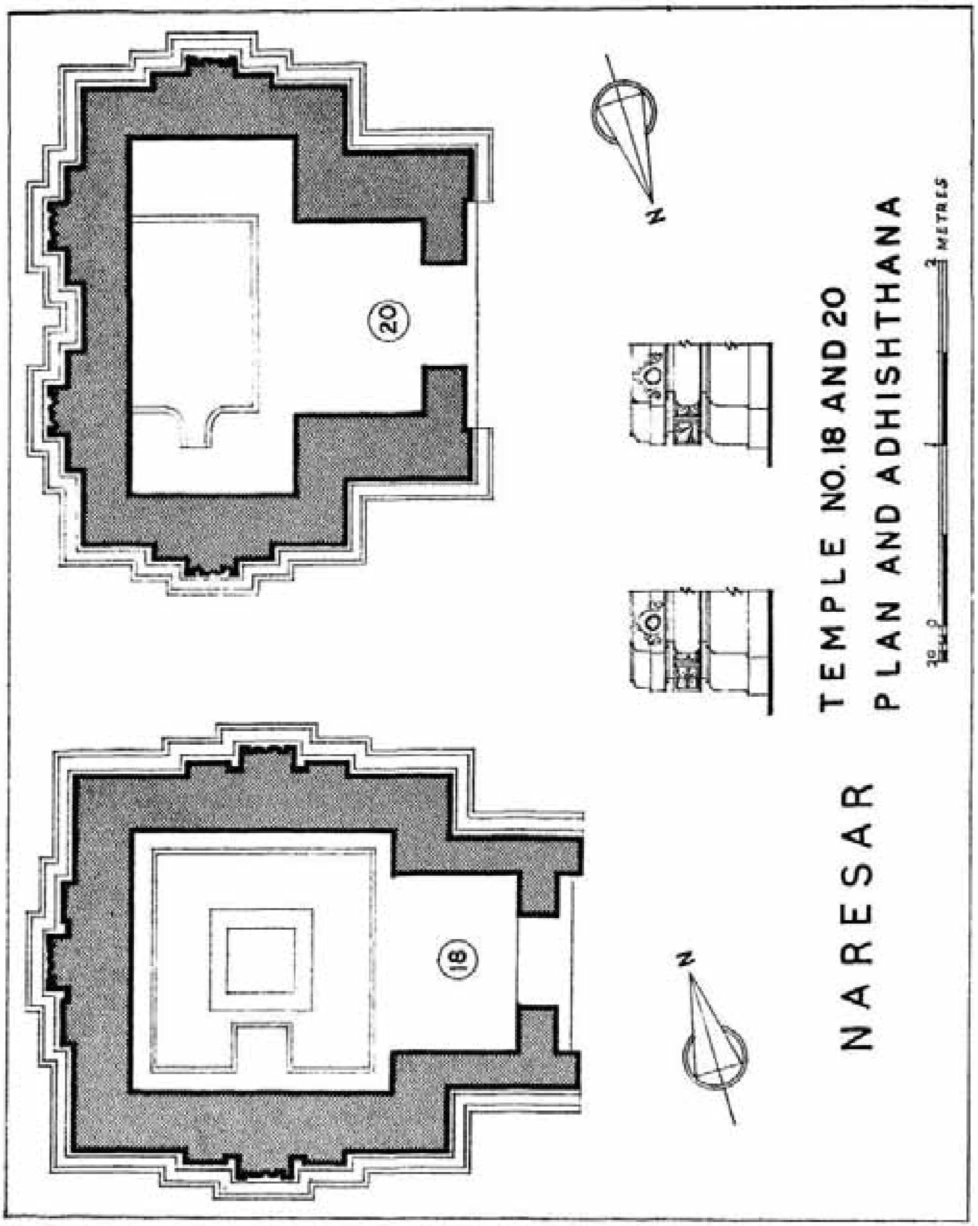

NARESAR
TEMPLE NO. 18 AND 20
PLAN AND ADHISHTHANA
METRES
18
20
N
N

FIG. 10

to the close of the tenth century A.D. or later, and involved both Brahmanical and Jaina temple patronage. The inscriptional data indirectly provides means to identify their temple activities, especially from the times of Sivamara II (A.D. 788-812) when Jainism had the status of a State religion. This was the time when Kambadahalli (District Mandya) and Sravanabelgola (District Hassan) received their special attention.

The monuments surveyed included: Begur, Biskur, Devanhalli, Gangavara, Manne and Sivaganga, District Bangalore; Dodshivara, Hunakunda, Madivala and Ramenahalli, District Kolar; and Bastihalli and Lakshmidevihalli, District Hassan.

The Somesvara temple, also called Tablesvara locally, at Gangavara, District Bangalore, possesses the full lineal complements of the sanctum, *ardhamandapa,* vestibule and front porch and is elevationally an *ekatala vimana* of the *vesara* order. The *adhishthana* portion consists *of tripatta kumuda, kantha* and *kapota.* The wall portion is pilastered but devoid of *devakoshthas.* The *valabhi* motif, besides *hamsas* has also elephant in its frontal aspect, upon the side pilasters (pi. XLIV A). The *gopura-dvara* is surmounted by a later and modest *sala-sikhara* (pl. XLVA). No epigraphical support is available for this feature, although the main temple proper may be dated to the end of the ninth century A.D. or later.

At Begur, also known as Veppur and identified as *Bempurisvara-sthana,* referred already in the Mollohalli grant of Ganga king Durvinita (A.D. 495-535), the Negesvarasvami temple, alone appears to be a Ganga work, by Ereyappa *alias* Nitimarga II (A.D. 907-919). The others are of Chola style and no structure earlier to the early tenth century is noticeable. Facing east, the Nagesvarasvami temple has a typical Dravida *sikhara,* a *dvitala vimana,* having an *anarpita hara of kuta* and *sala* extending also over the closed walls of the *mahamandapa.* The *dvara* is flanked by small niches containing what appears to be the Ganga-Yamuna figures. The *koshthas* over the *mahamandapa* and sanctum exteriors contain images while the sculptured *valabhi* has rows of geese and *bhutamala* intercepted also by the narrative friezes from *panchatantra.* Perforated screen-windows and door frames in black basalt perhaps suggest Nolamba contacts.

Manne, District Bangalore, by its Akka-tangi *devalaya,* Kapilesvara, Somesvara, Sule *devalaya* and Mannaramma temples indicates its importance during the Ganga times in the eighth-ninth century A.D., when Sripurusha (A.D., 725-788) shifted the capital to Manne from Kolar, following the defeat at the hands of the Rashtrakuta king Krishna I.

. The temples of Kapilesvara and Somesvara have brick foundations, ascribable to an antecedent period when brick tradition existed. The former located on the tank bund, Chikkakere, and facing east through a balustraded flight of steps, is in a dilapidated condition (pl. XLVI A). Projections on the southern and northern sides have prominent perforated screen windows often of carved scroll work, issuing out of the *makaras* and the circular scrolls carrying *mithunas* (pl. XLV B). Life-size *dvarapalakas* of later times flank the entrance. The door frame is of the *trisakha* type surmounted by *sala-sikhara.* The *adhishthana* has, still visible, original brick (size: 35 X 18 X 9 cm) mouldings (pl. XLVI B), repaired in two subsequent phases in stone. The other temple Somesvara, situated in the fields and totally renovated, has also its *adhishthana* of bricks of the same size and pattern as at the Kapilesvara temple noted above.

The Akka *devalaya* of the same place located to the north-west of the village has an eastward entrance. The *adhishthana* is buried up to *tripatta kumuda* level, carrying on its top a *pattika.* The *devakoshthas* at the cardinal points of the walls are now empty. The tower is missing. The Kapilesvara and Somesvara temples may be ascribed to the eighth and the ninth century A.D., while the Akka *devalaya* may, in all probability, be even later. The Jaina temple, locally known as *Sule devalaya,* generally ascribed to the late eighth century A.D., lies in a ruined condition in the village.

The Gangadharesvara temple at Dodshivara, District Kolar, also has brick remains in its *adhishthana* level. It has *garbhagriha* of two facing shrines joined by a common *mandapa.* Some of the loose sculptures found in the precincts include those of Karttikeya, *saptamatrikas* (inside the

temple) and the inscribed relief carving on basalt of Vishnu kept outside. The standing Vishnu, with hair-do like the late Pallava images, is four-handed, the upper two hold a four-spoked *chakra* and *sankha* respectively; and the lower right hand is in *arghya* pose, the left grasping the *yajnopavita,* in a ritual pose; the sparse ornaments comprise *karnakundalas,* a necklet and a *kanthahara* and a short skirt-like lower garment, reaching up to the ankle and held by an ornate *mekhala.* An inscription in two lines occurring vertically below the lower left hand, was found written in Kannada characters of seventh-eighth century A.D. (pl. XLIV B). Another similar slab has the figure of eight-handed Durga with her stag *vahana* standing towards the right. Stylistically, the figure bears likeness to the other Vishnu image.

Another interesting feature of this area lies in the distribution of low, dolmen-like slab chambers containing sculptured hero-stones or deities. A huge cluster of such stone chambers were noticed in a field south-west of Dodshivara village (pl. XLVII A) and also near the Gangadharesvara temple at Madivala (pl. XLVII B), District Kolar. In the case of smaller chambers which are generally square, the back slab itself has the sculptured relief of heroes or war scenes, etc. In the bigger rectangular chambers at Madivala, *saptamatrika* images were fixed over a raised rectangular platform, the entrance facing north as is appropriate.

IX. PRESERVATION OF MONUMENTS

MONUMENTS OF NATIONAL IMPORTANCE

CENTRAL CIRCLE

Madhya Pradesh

1. LAKSHMANA TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR.—Reconstruction of *sikhara* of the north-western subsidiary shrine (pl. XLVIII) of the Lakshmana temple was taken up after removal of later plaster, dismantling *lakhauri* brickwork, taking out and resetting the old bulged out stones. Reconstruction of the *sikhara* was done in cut stone masonry in lime mortar with shallow fret design matching the original and in order to prevent movement and displace ment of stones, the ordinary mortar joints between them were strengthened with copper clamps.

2. ALAMGIR GATE, MANDU, DISTRICT DHAR.—The roof of the gate which was leaking at various places was watertightened in lime-cement-concrete. Pointing was done to the southern wall of the gate after raking out the mortar.

3. BHANGI GATE, MANDU, DISTRICT DHAR.—The northern and southern walls of the gate, which had almost collapsed, were taken up for conservation. After removal of debris, the walls were rebuilt in coarse rubble and random rubble masonry in lime-mortar.

4. DARYA KHAN'S MOSQUE, MANDU, DISTRICT DHAR.—The mosque, which is in a very-dilapidated condition, was taken up for major conservation work in a phased manner. The western and northern walls of the mosque were out of plumb from bottom to top and had developed wide cracks, the roof near the central dome having collapsed and sunk at places.

In the first phase, two of the arches supporting the main dome were entirely restored in random rubble. Thereafter, besides filling in of the cracks, the collapsed portion of the main dome and the squinches were restored in random rubble masonry while the bricks used in the dome both in the extrados and the intrados were replaced by specially-prepared new bricks. Finally, the dome was plastered in *lime-surkhi* mortar (pl. XLIX). The work is in progress.

5. DARYA KHAN'S SARAI, MANDU, DISTRICT DHAR.—The monument was covered with debris and excessive vegetation and it was difficult to enter the monument. In the first instance, thick vegetation growth was removed and the work of clearance of debris, both in front and inside, was taken up.

After removal of the debris in front, the cells on the eastern side of the main entrance gate were repaired. This work included reconstruction of arches in front of the cells and watertighten-ing of the roof in the front portion. Debris has also been cleared in the northern half from inside the Sarai. The work is in progress.

6. DARYA KHAN'S TOMB, MANDU, DISTRICT DHAR.— The central dome and the lour corner domes which were leaking during the rains because of the dead mortar were entirely re-plastered in *lime-surkhi* mortar after removing the dead mortar. The casing stones on the western side of the drum portion of the dome, wherever damaged, were removed. Moreover, recess pointing was done in the joints of the wall over which the dome rests.

7. DELHI GATE, MANDU, DISTRICT DHAR.—The top portion of walls of the passage between the inner and the outer gateway was restored in random rubble masonry in *lime-surkhi* mortar. Pointing was done to the wall on the southern side inside the inner gateway. Water tightening was done to the walls on the portions flanking the outer gateway.

8. MALIK MUGHITH'S MOSQUE, MANDU, DISTRICT DHAR.—The roof of the mosque, including the three domes, which was leaking at various points was completely watertightened. The work entailed filling in of the cracks, removal of old dead mortar from the roof and the surface of the domes, laying fresh lime-concrete, re-plastering of the three domes and the parapet walls and redoing the merlons on the lower portion of the domes (pl. L).

The southern wall of the courtyard of the mosque was pointed and watertightened.

9. TOMB OF SHAH NUMA, ASIRGARH, DISTRICT EAST NIMAR.—The entire tomb including floor, the roof and the walls were re-plastered, as the original plaster had already become weak. Stone pitching was done to the tomb outside.

10. MAMALESVARA TEMPLE, MANDHATA, DISTRICT EAST NIMAR.—Apart from providing barbed-wire fencing, removal of modern accretions, double-shutter wicket gate was provided and boundary walls of the fallen portions of the temple were restored.

11. NIZAM-UD-DIN'S FAMILY TOMB, CHANDERI, DISTRICT GUNA.—The compound wall, which had collapsed has been rebuilt in C. R. masonry. The work is in progress.

12. SHAHZADI-KA-RAUZA, CHANDERI, DISTRICT GUNA.—The work of pointing the G. R. masonry of the enclosure wall of Shahzadi-ka-Rauza and the coping stone and cut-stone work was completed.

13. TOMB OF ABUL FAZL, ANTRI, DISTRICT GWALIOR.—The sunken and damaged stone flooring of the platform around the tomb of Abul Fazl was taken up for repair. The work included removal of damaged stones and re-setting the entire floor with proper pointing and watertightening. Doors were also provided to the tomb.

14. TOMB OF MUHAMMAD GHAUS, GWALIOR, DISTRICT GWALIOR.—In continuation of previous year's work *(1975-76,* p. 97), the stone slab flooring around the graves in the Muhammad Ghaus tomb-complex was completed.

15. PAINTED ROCK-SHELTERS, ADAMGARH, DISTRICT HOSHANGABAD.—Barbed wire fencing in angle iron posts with an entrance gate was provided in the area containing painted rock-shelters.

16. CHAUSATH YOGINI TEMPLE, BHERAGHAT, DISTRICT JABALPUR.—Pitching was done to the incomplete and eroded portions of the compound wall; the boundary wall near the staircase leading into the temple compound was completed. The joints in flagstone flooring of the *pradakshinapatha* were also pointed.

17. GAURI SANKAR TEMPLE, BHERAGHAT, DISTRICT JABALPUR.—The flagstone flooring of the courtyard, which had sunk at places and the points of which had been exposed, was taken up for conservation work. The sunken flagstone flooring was re-set in proper position and pointing of the joints was done in cement mortar.

18. TAPSI MATH, BILAHRI, DISTRICT JABALPUR.—Portions of walls of this structure, where the stones had either become loose or were dislodged were underpinned and set in position. The cracked lintel was supported by means of angle iron. A coarse rubble masonry wall was re-built and the flooring of the *matha* inside was laid with flagstones.

19. MAD AN MAHAL, GARHA, DISTRICT JABALPUR.—The conservation works at this monument included scraping the scribblings on walls of the building with soda and soap, under pinning of loose masonry wall in random rubble masonry in lime-*surkhi* mortar, providing coarse rubble masonry in the balcony of the first floor and patch repairs to the decayed floor.

20. SIVA TEMPLE, BHOJPUR, DISTRICT RAISEN.—In continuation of previous year's work *(1975-76,* p. 98) the reconstruction of the stone masonry platform in front of the Siva temple was in progress. The entire floor of the platform was re-laid by removing the sunken and damaged stones and using new stones as well as the original stones. The ashlar masonry wall on the southern side of the platform, including a niche, was re-built in lime-cement mortar. The work of completing the remaining portion of the platform in front and sides of the entrance gateway of the temple is in progress.

21. GOND FORT, DHAMONI, DISTRICT SAGAR.—Thick jungle growth and vegetation, because of which the fort and the monuments inside were inapproachable, was cleared from the area in and around some important monuments e.g., Rani Mahal and the mosque inside the fort.

22. VARAHA FIGURE AND OTHER GUPTA REMAINS, ERAN, DISTRICT SAGAR.—TheVaraha figure (pl. LI), which had been damaged considerably and its chipped portions had been bound together with a metal belt fixed with the help of nuts and bolts, was taken up for repairs. After recent theft of the belts, three large pieces which had been fixed earlier from the main body had remained in position because of the screws and bolts. Before taking up the work, the figure was provided with a temporary support of bricks in mud-mortar underneath and on both sides to prevent the chips from falling.

The work, executed by Shri T. N. Padmanabhan, Senior Modeller, Museums Branch, entailed joining the broken pieces by rock bolting with the help of non-magnetic stainless steel rods, grouting the cracks and fissures with araldite and fixing similar stone in the missing portions of the figure.

Similar measures were also taken for the two pillars opposite the Varaha and the Vishnu figures. These pillars had developed vertical cracks and metal belts had been tied with the help of nuts and bolts in order to prevent the developing of cracks and to check the pillars from splitting into parts.

Besides removing the metal belts from both the pillars, the cracked portions were rock-bolted with stainless steel rods and grouted with araldite epoxy resin; the bracket, which had been fixed on top of the stone pillar opposite the Varaha figure was replaced by the original member which was lying at the site.

23. FORT, KHIMLASA, DISTRICT SAGAR.—Vegetation from inside the- fort, over the monuments and the fort wall was removed.

24. BUDDHIST STUPAS AND OTHER REMAINS, PANGORARIA, DISTRICT SEHORE.—While formalities for the protection of the Buddhist remains consisting of stupas, ancient pathway and Asokan edict are being done, the work of removal of debris from around the ancient structures and clearance of ancient pathway was carried out.

25. LOHANGI, DISTRICT VIDISHA.—G. I. pipe railing with the stone pillars and a turnstile gate were provided around the pillar capital at Lohangi hill-top.

DELHI CIRCLE

Delhi

26. CITY WALL, DELHI.—The rampart wall between the Kashmiri gate and water-bastion was strengthened by watertightening its joints and restoring the stone cornices by replacing the broken and missing stones.

27. JAMI MASJID, DELHI.—Bulged and pulverized cut-stone ceiling of the main chamber of the Masjid was restored maintaining the original shape, design, texture and colour.

28. RED FORT, DELHI.—The south-east part of the fortification wall was exposed to view with the removal of silt and debris. In the course of clearance-work in the fountain-tank between the Rangmahal and Diwan-i-Am were brought to light a number of fountain-wells as well as earlier causeway in the centre. Channels were cleaned for reflow of water to the fountains through the original channels. The work is in progress.

The original plinth around the Diwan-i-Am was exposed and over it was provided the carpeting by means of dressed red sandstone pavement. Further, the original steps at its southern side were preserved alongside the adjoining stone pavement.

29. ROSHANARA BARADARI, DELHI.—Sunken, damaged and petered old brick-pavement of the masonry platform had been restored to its original form with the help of cut-to-size moulded bricks having geometrical designs. Moreover, exposed fountains were conserved on the lines of their original ones.

30. BARE KHAN AND CHHOTE KHAN'S TOMBS, NEW DELHI.—Masonry walls around the tombs were strengthened. Decayed and pulverized plaster was carefully stripped off before replastering. These apart, restoration of damaged and missing cut-stone facade as well as the filleting of the Arabic inscriptions were attended to.

31. BHURE KHAN'S TOMB-COMPLEX, NEW DELHI.—The protected area was provided with masonry enclosure wall and M. S. railing posts.

32. HUMAYUN'S TOMB, NEW DELHI.—Decayed and sunken stone-flooring of the eastern side of the central podium was replaced by dressed red sandstone pavement. The work is in progress.

33. KHUNI DARWAZA, NEW DELHI.—This monument of the Bahadur Shah Zafar Marg was repaired and strengthened.

34. KOTLA FEROZ SHAH, NEW DELHI.—Its northern fortification wall has been restored. The face and top of the fallen masonry of the wall was underpinned and watertightened while the joints filled up and pointed with concrete.

35. LAL KOT, NEW DELHI.—During the clearance operations the part of the wall and the bastions which were laid bare had been strengthened properly.

36. NAZF KHAN'S TOMB, NEW DELHI.—Damaged and missing masonry of the enclosure wall was restored.

37. PURANA QILA, NEW DELHI.—Damaged pillars, arches and walls of the Talaqi gate were repaired and strengthened by watertightening and pointing the joints. Its interior floor was restored after removing decayed concrete plaster. All the petered masonry of inner cells was repaired and the terrace and floor had been watertightened by providing fresh layer of concrete.

38. QUTB MINAR, NEW DELHI.—After carefully chiselling and scooping out the damaged and pulverized veneer-stones and strengthening the inner core with liquid cement mortar the new cut and moulded veneer-stones were fixed *in situ.* Designs and inscriptions on replicas were reproduced as in the originals. Lateral and interal bonds of the masonry were also provided.

39. SAFDARJANG'S TOMB, NEW DELHI.—Dead plaster of the outer face of the main gate was stripped off with a view to replastering after filling up the hollows. Borders and cornices were reproduced in original form.

40. SUBJ BURJ, NEW DELHI.—Restoration was carried out of the damaged masonry of the cells in the ground and first floor as well as of the floor and terrace-concrete of the *burj.*

41. TUGHLAQABAD FORT, NEW DELHI.—Bulged out and damaged masonry of the fortification was carefully dislodged in order to reconstitute it in accordance with its original alignment.

EASTERN CIRCLE

Assam

42. CACHAR RUINS, KHASPUR, DISTRICT CACHAR.—Damages were repaired by lime-concrete after removing the decayed parts and underpinning. All the deep rooted trees were removed.

43. BAMUNI HILLS, TEZPUR, DISTRICT DARRANG.—A barbed wire fencing was provided.

44. CHARAIDEO MAIDAM, CHARAIDEO, DISTRICT SIBSAGAR.—The monument was cleared of all rank vegetation.

45. BISHNUDOL, GAURISAGAR, DISTRICT SIBSAGAR.—A barbed wire fencing was provided around the monument.

46. KARENGHAR PALACE, JAYSAGAR, DISTRICT SIBSAGAR.—The decaying floor of the palace was repaired.

47. RANGHAR PAVILION, JAYSAGAR, DISTRICT SIBSAGAR.—Its *chhajja* was repaired and a barbed wire fencing provided (pl. LII).

48. SIVA TEMPLE, NEGHERETING, DISTRICT SIBSAGAR.—The brickwork was reconstructed with composite mortar.

Orissa

49. PANCHA-PANDAVA TEMPLE, GANESWARPUR, DISTRICT CUTTACK.—The pavement of the temple was renewed.

50. EXCAVATED BUDDHIST SITE, RATNAGIRI, DISTRICT CUTTACK.—The decaying stones of drain and pavement were replaced. Also, boundary pillars in R.C.C. were fixed.

51. EXCAVATED SITE, LALITAGIRI, DISTRICT CUTTACK.—In order to prevent the rain water from getting in, the excavated trenches were provided with sheds.

52. NILAMADHAVA AND SIDDHESVARA TEMPLE, GANDHARADHI, DISTRICT PHULBANI.—The pavement was reset after proper levelling.

53. BAKESVARA TEMPLE, BHUBANESWAR, DISTRICT PURL—In continuation of the previous year's work, the loose and cracked stones of the temple were replaced and reset. The carved mouldings on them were also reproduced.

54. BRAHMESVARA TEMPLE, BHUBANESWAR, DISTRICT PURL—In continuation of the previous year's work the cracks and open joints on the main spire of the temple were repaired by grouting and pointing. Besides, the missing ornamental pieces were renewed.

55. ISANESVARA TEMPLE, BHUBANESWAR, DISTRICT PURL—The missing stones here were replaced.

56. LINGARAJA TEMPLE-COMPLEX, BHUBANESWAR, DISTRICT PURI—At the main temple an underground drain was laid with open pipes for draining out the accumulated water from around the wall near the kitchen to the Municipal drain outside the *simhadvara.*

At the Bhairavi temple, the first phase of work of renewing the damaged portions of the stepped roof of the *jagamohana* and carving the mouldings on the string courses and projections on the stepped roof had been completed (pl. LIII).

While the structural repair to the Durga temple was carried out, grouting and pointing of the open joints and cracks were completed at the Ganesa temple.

The work of renewing *pidha* and carving out details of the Mangala temple has been undertaken

57. MAKARESVARA TEMPLE-COMPLEX, BHUBANESWAR, DISTRICT PURL—The loose and cracked stones of the main temple were removed and new ones reset with the help of copper clamps and dowels, besides reproducing the carved mouldings.

The dislocated masonry from the outer facade of the minor shrine here was completely reset along with the renewal of missing portions, grouting of cracks, carving out the broad outline and inserting new stones at places worn out (pl. LIV).

58. SUN TEMPLE, KONARAK, DISTRICT PURI.—In continuation of the previous year's work the steps of the main temple were repaired by providing missing stones. The work of providing pathway around the structure and sorting of architectural pieces from the temple-compound was undertaken.

59. JAGANNATHA TEMPLE-COMPLEX, PIRI, DISTRICT PURI.—In continuation of the last year's work the damaged roof of the Kurmi-bera was re-terraced and watertightened with

lime-concrete. Apart from the pointing the stone work with cement mortar, the open joints of the main *deul* were filled up similarly. After taking necessary steps for the preservation and restoration of the already-exposed portion, the work of further removal of plaster was taken up again in the main *deul.* A barbed wire fencing was provided around the temple except towards the south-east and north-east corners.

At the Lakshmi temple the work of recess-pointing of the superstructure has been taken up.

West Bengal

60. TEMPLE-GROUPS, BISHNUPUR, DISTRICT BANKURA.—While the work of dressing the compound of the Jor-Bangla temple was done, the protected area of the Kalachand temple had been fenced. Repairs were carried out to the ornamental portion of the eaves of the Rashmancha.

The salt affected bricks of the Shyam Rai temple were replaced.

61. RAMACHANDRA TEMPLE, KALNA, DISTRICT BURDWAN.—The pulverized lime-concrete from the open terrace and floors was pecked up and reterracing of the floors done with lime and *surkhi.*

62. MOSQUE AND TOMBS, SAPTAGRAM, DISTRICT HOOGHLY.—Salt-affected bricks were replaced and the original texture brought out.

63. DARGAH OF ZAFAR KHAN GHAZI, TRIBENI, DISTRICT HOOGHLY.—After repairing the pathway, the fencing was laid around the protected area.

64. MONUMENTS OF GAUR AND PANDUA, DISTRICT MALDA.—In continuation of the last year's work the repair to the broken vaulted roof of the Dakhil Darwaza at Gaur was completed (pl. LV). Here at the Gumti gate, was reproduced the ornamental brickwork while the decayed terrace of the Gunmat mosque had been dismantled for a thorough reconstitution (pl. LVI).

Underpinning of the brickwork of the damaged part of the Adina mosque, Pandua, was carried out.

65. IMAMBARA, MURSHIDABAD, DISTRICT MURSHIDABAD.—In continuation of previous year's work the repair to its damaged roof was taken up by replacing the worn out beams of the ceiling. Reterracing of the roof was also undertaken.

MID-EASTERN CIRCLE

Bihar

66. ANCIENT SITE OF VIKRAMASILA MAHAVIHARA, ANTICHAK, DISTRICT BHAGALPUR.---Restoration or reconstitution-work comprised: brick courses and stone pavement reset in the northern flight of steps of the main gate; resetting of dislodged brick courses in lime-mortar in the eastern wing of the monastery: refixing, in brick masonry, of door-jambs of the north chapel of the main shrine; removal of loose debris from the south-western part of the *pradakshina-patha;* laying over of the lime-concrete on the .second *pradakshina-patha* after dismantling the decayed concrete; restoration of the robbed part of the lower wall, on the north-western, of the circumambulatory path; construction of tile-shed on the rebuilt walls of the east chapel of the principal shrine; and restoration of the flight of steps, leading to the main shrine, in brick masonry laid in lime-mortar and finished with recessed pointing.

67. ROCK-SCULPTURES, PATHARGHATTA, DISTRICT BHAGALPUR.—Debris on the sides and in front of the first cave from the north were removed in order to level and dress the surface. A stone pavement and a flight of steps in stone masonry were also provided.

68. BUDDHIST STUPA, KESARIA, DISTRICT EAST CHAMPARAN.—Besides removing the wild vegetation, the approach pathway to the site was reconditioned.

69. EXCAVATED REMAINS, KUMRAHAR, DISTRICT PATNA.—The pathways around the assembly hall were reconditioned by laying fresh lime-concrete after dismantling decayed one.

70. ASOKAN COLUMN, LAURIYA ARERAJ, DISTRICT WEST CHAMPARAN.—The western side of the protected area was provided with barbed-wire fencing and an iron gate.

Uttar Pradesh

71. KHUSRI BAGH, ALLAHABAD, DISTRICT ALLAHABAD.—Several works were carried out in this group of monuments of which the following worth special mention. The eastern enclosure wall was rendered watertight by raking out the dead mortar from the masonry joints, followed by pointing with toned lime-mortar. After the removal of the decayed plaster from the wall surface of the tombs of Bibi Tambolan, Sultan Khusru, Shah Begham, Sultan Khusru's sister and the gateway, replastering with lime-cement mortar was carried out. Moreover, fresh lime-mortar was relaid on the terrace of the tomb of Bibi Tambolan and on the eastern side of the first floor of the gate after the removal of the decayed ones. Apart from repairing and repainting of the wooden and expanded iron shutter cultural notice-board for each individual monument was provided. With a view to commissioning the old fountains the ancient well was fitted with a diesel pump-set. At present the areas round the tombs were fenced with barbed wire. It may also be mentioned that ventilators of the basement of the tomb of Shah Begham were provided with angle-iron frame and expanded metal *jali.*

72. SUPPOSED RESIDENCE OF ALA AND UDAL, CHILLA, DISTRICT ALLAHABAD.—A large portion of the stone dwelling house said to have been the residence of the two heroes of the eighth century A.D. was freed of debris and vegetation.

73. GARHWA FORT, SHEORAJPUR, DISTRICT ALLAHABAD.—Besides removing vegetation, the dislodged rubble masonry of the bastion and the flanking walls of the palace-complex inside the fort was reset in lime-cement mortar. Two ancient tanks were desilted to admit clean water.

74. TOMB OF DAULAT IBRAHIM, MAHNAGAR, DISTRICT AZAMGARH.—Wide and deep joints in the brick masonry were filled by recess pointing while door-and window-openings had been provided with expanded metal shutters. The protected area was fenced and a turn-style gate provided.

75. JETAVANA MAHAVIHARA, SAHET (SRAVASTI), DISTRICT BAHRAICH.—Upper brick courses of the Monastery 7, the stupa and the Gandha-Kuti were reset in lime-mortar and watertightened by recess-pointing. Similar works are in progress in Temple 1 and Monasteries F and G.

76. KALINJAR FORT, KALINJAR, DISTRICT BANDA.—Raja Man Singh's palace inside the fort was cleared of vegetation and accumulated debris.

77. REMAINS OF TEMPLE, RAMNAGAR, DISTRICT BANDA.—The temple was cleared of shrubs and grass while the removal of accumulated debris brought to view its hitherto concealed plinth and the dislodged flight of steps which was restored. Structural members dislocated from the monument were collected and arranged systematically.

78. EXCAVATED REMAINS, GANWARIA AND PIPRAHWA, DISTRICT BASTI. —The northern monastery at Piprahwa, western and eastern monasteries of Ganwaria had their upper brick courses reset in lime-mortar and rendered watertight by recess pointing.

79. BUDDHIST REMAINS, KUSHINAGAR, DISTRICT DEORIA.—With a view to constructing the superstructure over the ancient brick stupa, old brick-platform was strengthened by filling in the cracks, besides underpinning and resetting the dislodged brick courses. The surface was rendered watertight by recess pointing. A circular ring-trench was cut through the platform and RCC foundation laid. In the Nirvana temple the electrical fittings were reconditioned.

80. TOMB OF SHUJA-UD-DAULA, GULAB-BARI, FAIZABAD, DISTRICT FAIZABAD.—Pathways in the foreground were paved with bricks laid on lime-concrete base and the flooring in the western verandah of the tomb was reconditioned by laying flag-stones on lime-concrete base. Decayed plaster was removed from the ceiling of the western verandah and ralaid by fresh one. All these apart, the wooden gateway of Gulab-bari was given a coat of preservative.

81. SHAHI FORT, JAUNPUR, DISTRICT JAUNPUR.—In the Hammam or Turkish bath, the openings in the ceilings of the dome, besides the door and window-openings, were covered with glass and expanded metal. For obtaining water for horticultural activities two old wells were desilted. Dead lime-concrete was replaced by fresh one on the pathway between the Hammam and Hawalat, the latter being provided with M. S. Grillage in the foreground. Cracks in the ceiling of the Hawalat were filled in.

82. INSCRIBED LAT, PRAHLADPUR, VARANASI, DISTRICT VARANASI.—Missing stone posts and G. I. pipes were provided to the rail, enclosing the Lat, standing in the compound of the Queen's College.

83. EXCAVATED REMAINS AND MUSEUM BUILDING, SARNATH, DISTRICT VARANASI.— The compound wall of Kumaradevi's monastery was strengthened by underpinning and recess pointing. In the foreground of the Museum was laid brick-on-edge pathway. For purpose of security compound wall towards the east was raised. Mention may be made of the water proofing treatment which is being carried out over the roof of the Museum building and its godown.

MID-SOUTHERN CIRCLE

Karnataka

84. TIPU SULTAN'S PALACE AND OTHER MONUMENTS, BANGALORE, DISTRICT BANGALORE.— Kerb stones were fixed for the open area handed over by the Victoria Hospital along with the fort-wall. Above the kerb stones will be fixed the iron grill, the work of which along with the laying out of a garden is in progress. Lawns in front of the Palace are also being relaid and the arrangement for flood-lighting the monument and its garden is in progress.

85. KALLESVARASVAMI TEMPLE, BAGALI, DISTRICT BELLARY.—The loose lime-concrete over the roof was replaced by fresh cob concrete after duly watertightening the joints. The open area on the west was extended after levelling the ground and constructing a retaining wall with grills.

86. CHANDRASEKHARA TEMPLE, KAMALAPURAM, DISTRICT BELLARY.—New paving stones were laid over the missing flooring of the *sabha-mandapa* and *ardha-mandapa.* Similarly, new stones replaced the broken ones of the ceiling on the northern side of the *antarala.* Missing stones of the caves of the *sabha-mandapa* were substituted by new ones. In place of earlier one, cut-stone masonry parapet with simple mouldings as in the original was provided.

87. GANAGITTI TEMPLE, KAMALAPURAM, DISTRICT BELLARY.—Damaged and missing paving stones of the *mandapa* are now being replaced by new ones.

88. HAZARA RAMA TEMPLE, KAMALAPURAM, DISTRICT BELLARY.—The open area in front has been fenced by barbed wire.

89. PATTABHIRAMA TEMPLE, KAMALAPURAM, DISTRICT BELLARY. Missing roof-slabs of the *antarala* and damaged flooring stones of the *ardha-mandapa* were renewed, and new beams provided as per the original construction dismantling the masonry supports.

90. QUEEN'S BATH, KAMALAPURAM, DISTRICT BELLARY.—Open area in front is being enclosed by dwarf masonry wall.

91. KRISHNA TEMPLE, KRISHNAPURAM, DISTRICT BELLARY.—The stucco-work ol the sub-shrines and the northern *gopuram* was redone wherever it had peeled off or worn out.

92. SURYANARAYANA TEMPLE, MANGALAM, DISTRICT BELLARY.—The open area on three sides has been provided with dwarf wall and barbed-wire fencing. A wooden door on the lines of the old one was fixed at the entrance.

93. BHIMESVARA TEMPLE, NEELGUNDA, DISTRICT BELLARY.—The decayed lime-concrete and brick-bat filling over the *sabha-mandapa* have been removed. The reconstruction of the fallen *sikhara* on the western side has been taken up.

94. VISHNU TEMPLE NO. 1, VENKATAPURAM, DISTRICT BELLARY.—A part of the *mandapa*-roof near Chakra-tirtha has been watertightened by laying fresh cob concrete, and the flooring redone with new stones. Efforts are being made to collect stones to fill in the gaps in the paved portion of the *mandapa.*

95. VITTALA TEMPLE, VENKATAPURAM, DISTRICT BELLARY.—The work of providing beams, ceiling slabs and capitals of the *ardha-mandapa* is in progress. Here the electrification of the *garbha-griha* and *pradakshina-patha* has been completed. A new approach road from Talaraghatta to the Vittala temple through the centre of the Vittala bazar has been planned; its earth-work is completed while the collection of soling material is in progress.

96. AMBIGER-GUDI 1 AND 2, AIHOLE, DISTRICT BIJAPUR.—The work of replacing missing stone slabs of the portions of the ceiling is in progress.

97. BILA-GUDI, AIHOLE, DISTRIGT BIJAPUR.—The construction of missing platform in front is in progress. A new approach road connecting the main road has been laid and covered with red *muram.*

98. CHIKKI-GUDI, AIHOLE, DISTRICT BIJAPUR.—The base of the apsidal temple was exposed after the removal of debris. Besides laying out an approach road connecting the main road to the temple, the area around the temple was levelled.

99. CHARANTI-MATH, AIHOLE, DISTRICT BIJAPUR.—A flagstone pavement was provided, while the roof of the *math* had been watertightened.

100. DURGA TEMPLE, AIHOLE, DISTRICT BIJAPUR.—Electricity arrangements in the *sabha-mandapa* and *garbha-griha* will soon make it possible to check the nuisance of bats. An electric motor-pump was installed for drawing water from the well for the purpose of maintenance of garden.

101. GALAGANATHA GROUP OF TEMPLES (NOS 1 TO 15), AIHOLE, DISTRICT BIJAPUR.—The work of construction of the toe-wall and retaining wall with barbed-wire fencing is in progress.

102. GAUDAR-GUDI 1, AIHOLE, DISTRICT BIJAPUR.—The broken ceiling slabs were replaced by the ones matching the originals.

103. HUCHHAPPAYYA-MATHA, AIHOLE, DISTRICT BIJAPUR.—The raised platform on the eastern and southern sides has been levelled up to the working level of the temple and the debris removed.

104. JOTIRLINGA TEMPLE, AIHOLE, DISTRICT BIJAPUR.—For the main temple, flagstone pavement was provided in the missing parts while the base of the open *mandapa* had been strengthened by underpinning and construction of a basement wall.

105. KARE-GUDI, AIHOLE, DISTRICT BIJAPUR.—While rebuilding of the missing part of the wall is in progress, the area around was levelled by filling up the low-lying area with earth and rubble.

106. MALLIKARJUNA TEMPLE-COMPLEX, AIHOLE, DISTRICT BIJAPUR.—There had been stagnation of water in the low-lying area around the temple and the adjoining smaller buildings, and this has now been remedied by filling up the area with rubble and earth. For enclosing the open area, a dwarf wall with grill-work and barbed-wire fencing was raised.

107. MEGUTI TEMPLE, AIHOLE, DISTRICT BIJAPUR. —Apart from providing steps of cut stone in place of loose stone steps connecting the temple with the double-storeyed Jaina temple and cave, steps have been taken for replacements of missing pillars, beams and capitals of the front *mandapa.* These stone-works are to closely follow the original works of the temple.

108. RACHI-GUDI, AIHOLE, DISTRICT BIJAPUR.—The whole area between this temple and the Veniyar group has been levelled up after filling the ditches with rubble and earth.

109. SURYANARAYANA TEMPLE, AIHOLE, DISTRICT BIJAPUR.—The temple close to the Lad-khan has been taken up for repairs. All arrangements have been made to provide new large-sized blocks of stones for the ceiling of the *sabha-mandapa.*

110. VENIYAR-GUDI, AIHOLE, DISTRICT BIJAPUR.—New beams and ceiling stones for the broken and missing portions have been collected and the work is in progress.

111. JAHAN BEGUM'S MAHAL, AINAPUR, DISTRICT BIJAPUR.—The work of providing barbed-wire fencing with dwarf wall for the open area is in progress.

112. BHUTNATHA GROUP OF TEMPLES, BADAMI, DISTRICT BIJAPUR.—The group of temples on the east bank of the tank had their missing slabs of flagstone pavement replaced.

113. PALLAVA INSCRIPTION, BADAMI, DISTRICT BIJAPUR.—After levelling up the undulated area near the stone-inscription and sculpture-shed a garden was laid and area landscaped.

114. GOL-GUMBAZ, BIJAPUR, DISTRICT BIJAPUR.—The fallen enclosure wall at places was restored. Moreover, the rear *dalan* has been repaired, besides providing electricity and water-supply. Laying of cement concrete for flooring of the underground vaults is in progress.

115. JOD-GUMBAZ, BIJAPUR, DISTRICT BIJAPUR.—Arches of the *dalans* near the Khawaskhan tomb are provided with doors while the enclosure wall on the northern side has been raised to prevent trespassing and misuse of premises.

116. NITYA NAVARI TOMB AND MASJID, BIJAPUR, DISTRICT BIJAPUR.—Missing stones of the basement wall have been provided with new stones. Edge stones of the Masjid wherever missing were restored with mouldings as in the originals.

117. ZANJIRA OR MALIK JAHAN BEGUM'S MOSQUE, BIJAPUR, DISTRICT BIJAPUR.—Iron grill has been provided with dwarf compound wall on the road side. The height of the enclosure wall was raised to prevent unauthorized entry from the side of the bazar.

118. JAMBULINGA TEMPLE, PATTADAKAL, DISTRICT BIJAPUR.—Steps have been initiated to substitute the large-sized slabs of the ceiling.

119. KADASIDDHESVARA TEMPLE, PATTADAKAL, DISTRICT BIJAPUR.—Repairs to the ceiling of the temple have been taken up.

120. SANGAMESVARA TEMPLE, PATTADAKAL, DISTRICT BIJAPUR.—The entrance porch to the left has been repaired and wherever necessary missing stones replaced by new ones. The top of the plinth was watertightened.

121. VIRUPAKSHA TEMPLE, PATTADAKAL, DISTRICT BIJAPUR.—After fixing the concealed girders inside the cracked beams, the earlier ones supporting the broken beams were removed. Chiselled portions were finished with matching colour and texture. The missing ceiling stones of the sub-shrine on the north-east corner have been fixed with new ones. An electric pump-set has been provided on the river bank to supply water to the gardens around the monuments at Pattadakal.

122. AKKA-TANGI TEMPLE AND ASOKAN ROCK-EDICT, SIDDAPURA, DISTRICT CHITRADURGA.—The approach to the rock-edict of Asoka has been paved with stones after filling in the ditches and levelling the ground while the roof of the temple was watertightened.

12.3. FORT AND RAJA'S SEAT, MERCARA, DISTRICT COORG.—Fallen brick masonry wall of the fort has been reconstructed and plastered as per the original. Moreover, the rampart wall was watertightened by pointing.

At Raja's seat, concrete flooring was provided to repair the damaged parts. Colour wash has been given for the *mandapa* after removing the moss strains, etc.

124. TARAKESVARA TEMPLE, HANGAL, DISTRICT DHARWAR.—Soot and dust accumulated on ceilings, pillars, etc., were removed by washing with fresh water.

125. JAINA BASTI, LAKKUNDI, DISTRICT DHARWAR.—A retaining wall is being raised on the southern and western side; the open-air area near the temple is also to be fenced, for which work has already been initiated.

126. NANESVARA TEMPLE, LAKKUNDI, DISTRICT DHARWAR.—A dwarf wall with grill-work has been built around the acquired area. The area inside has been levelled and pits filled in. A garden is being laid around the temple.

A garden is coming up in the area to the south of the Kasi-Visvesvara temple, also at Lakkundi.

127. CHENNAKESAVA TEMPLE, ARAKERE, DISTRICT HASSAN.—There was a bulged portion of the outer wall and this portion was dismantled and reconstructed as per the original. The entire area around the temple has been levelled up.

128. KESAVA TEMPLE, BELUR, DISTRICT HASSAN.—Patch-works in cement done for the missing portions of the base were replaced by carved pieces, in soap stones, simulating the original ones. Around the *dvaja-stambha* a small garden is being developed.

129. HOYSALESVARA TEMPLE, HALEBID, DISTRICT HASSAN.—The polished Shahabad stones in the *navaranga* provided in the past for the missing flooring slabs have been replaced by soap stone pavement in conformity with the original construction. In order to supply water to visitors a pipeline has been laid from the bore-well to the Museum and toilets; a small engine-room for the pumping-set was built.

130. KEDARESVARA TEMPLE, HALEBID, DISTRICT HASSAN.—The enclosure wall was dismantled and the original courses of the base were exposed.

131. PARSVANATHA BASTI, HALEBID, DISTRICT HASSAN.—For the missing portion of the wall the stone pitching had to be provided with a proper slope to prevent sliding of earth.

132. KOLARAMMA TEMPLE, KOLAR, DISTRICT KOLAR.—The overhanging electrical wires have been removed and new wiring provided. With a view to laying a garden the area has been levelled up.

133. BHOGANANDISVARA TEMPLE, NANDI, DISTRICT KOLAR.—The roof of the cloister around the tank needs to be watertightened and the work has already been taken up. Repairs to stone pavement are also in progress.

134. LAKSHMINARASIMHA TEMPLE, MAREHALLI. DISTRICT MANDYA.—The *maha-dvara* which was out-of-plumb, has been set right after systematic dismantling, to be followed by careful reconstruction.

135. NARAYANASVAMI TEMPLE, MELKOTE, DISTRICT MANDYA.—Its old overhanging electrical wiring was replaced by new one. A new flooring of cement concrete was laid in place of damaged one in the *pakasala.*

136. NARASIMHA TEMPLE, SRIRANGAPATNA, DISTRICT MANDYA.—Its damaged ceiling was raked out and plastered, while new doors were provided.

137. SRI RANGANATHASVAMI TEMPLE, SRIRANGAPATNA, DISTRICT MANDYA.—Supports given for broken beams of the Hyder *Ali-mandapa* had to be removed after inserting concealed girders duly plastered with matching colour and texture.

138. NAMBINARAYANA TEMPLE, TONNUR, DISTRICT MANDYA.—New beams as per the original size and appearance were set in place of broken ones in the *pakasala.* For watertightening the front *mandapa,* the loose lime-concrete and brick filling were removed for laying fresh cob concrete and flat tiles.

139. SIDLU-MALLEKARJUNA TEMPLE, BETTADAPURA, DISTRICT MYSORE.—All materials for watertightening the roof have been collected on the top of the hill after the removal of the loose and damaged lime-concrete from the roof.

140. SRI VIJAYANARAYANA TEMPLE, GUNDLUPET, DISTRICT MYSORE.—The teak-wood door with ancient look had been fixed for the inner courtyard, and the main door of the *mandapa* has been repaired, strengthened and painted.

141. SRIKANTESVARA TEMPLE, NANJANGUD, DISTRICT MYSORE.—Stucco-figures on the northern parapet were restored by mending and grouting the joints. The thick lime-wash coating and silver paint were scraped off from walls, pillars and ceiling.

142. RAMESVARA TEMPLE, NARASAMANGALA, DISTRICT MYSORE.—An ornamental teak-wood door had been fixed for the main temple, and new stone steps provided with angle-iron and barbed-wire fencing.

143. KESAVA TEMPLE, SOMANATHPUR, DISTRICT MYSORE.—Concrete flooring has been laid inside the cells around the main temple after removing the dead concrete.

144. VAIDYESVARA TEMPLE, TALKAD, DISTRICT MYSORE.—The foundation around the temple was strengthened by underpinning in rubble stone masonry and cement mortar.

145. CHATURMUKHA BASTI, GERSOPPA, DISTRICT NORTH KANARA.—The leaky roof was provided with flat-tile courses and watertightened. Besides refixing fallen door-joints, the tilted lintel was set right in accordance with the original construction.

146. SHAHJI'S TOMB, HODIGERE, DISTRICT SHIMOGA.—The open area was cleared of all vegetation and a bore-well is being drilled.

147. RAMESVARA TEMPLE, KELADI, DISTRICT SHIMOGA.—The broken Mangalore tiles of the roof of the *Chandrasala* were provided with new tiles and the roof is now watertightened.

148. PRANVESVARA TEMPLE, TALGUNDA, DISTRICT SHIMOGA.—Keeping in view the original construction and the look the fallen wall of the temple has been reconstructed.

149. GOMATESVARA, KARKAL, DISTRICT SOUTH KANARA.—A new approach steps were provided from the main road. Over the *mandapa,* the decayed lime-concrete was removed in order to provide fresh concrete, and the roof watertightened.

150. MANGALADEVI TEMPLE, MANGALORE, DISTRICT SOUTH KANARA.—To watertighten the roof new tiles replaced the broken Mangalore tiles of the roof of the *Chandrasala.*

151. JAINA TOMBS, MUDABIDRI, DISTRICT SOUTH KANARA.—The open area around the seventeen tombs was fenced with barbed-wire with angle-iron.

152. MALLIK RIHAN DARGA, SIRA, DISTRICT TUMKUR.—For water supply, a bore-well is being drilled and the area around has been levelled for landscaping.

NORTHERN CIRCLE

Uttar Pradesh

153. CHINI-KA-RAUZA, AGRA, DISTRICT AGRA.— The restored arch on the southern side was plastered and the portion on the south-west was relaid with fresh lime-concrete.

154. FORT, AGRA, DISTRICT AGRA.—The arcade surrounding the quadrangle of the Diwan-i-Am was plastered and pointed; wall-tops at places were watertightened. The main hall in the Diwan-i-Am was paved with flagstones while staircase and causeways in the Anguri-bagh were pointed. In the Shish-mahal, the ceiling and the western wall of the southern room were restored by way of replacing missing carved glass over the room and repainting ornamental plaster over it. Missing white marble inlay bars were replaced in the facade of the parapet of Jahangiri-mahal. Drains and water-spouts were cleaned and restored.

155. ITIMAD-UD-DAULA'S TOMB, AGRA, DISTRICT AGRA.—The dislodged and broken brackets in the second and third floors were reset and replaced respectively with the help of copper clamps. The enclosure wall was also restored at places.

156. JAMI-MASJID, AGRA, DISTRICT AGRA.—The central and northern domes of the mosque were grouted and pointed, besides providing with fresh inlay bars wherever missing. The work of the south-west corner bay of the prayer hall has been started to set right the sunken floor.

157. JASWANT SINGH'S CHHATRI, AGRA, DISTRICT AGRA.—While the decayed roof and (floor was freshly laid with concrete, the compound wall on the northern side was subjected to underpinning and pointing at some places.

158. RAM-BAGH, AGRA, DISTRICT AGRA.—Apart from removing the debris from the under ground cells towards the river side, the arched openings in the gateway were underpinned and pointed wherever found necessary. Further, the undermined patches of *tehkhanas,* brick-work of the compound wall and in the underground cells were underpinned, besides repairing the damaged plaster.

159. TAJ MAHAL, AGRA, DISTRICT AGRA. —Decayed and dislodged stones of the causeways inside the Taj were replaced by fresh ones or reset as the case may be. Also inlay pieces missing

from the outer facade of the main mausoleum were replaced. The plaster mouldings and cut work have been restored in the underground cells. Missing *chhajja* stones of *gaushala* were replaced by new ones matching the original, and the flooring of the *dalan* on the western side was set right. The decayed stones forming geometrical pattern around the cypress trees on the side of the channel have been replaced and the sunken stones raised in position by providing *lakhauri* bricks underneath. Open joints in the central tank were pointed with special lime-mortar.

160. BURIYA-KA-TAL, ETAMADPUR, DISTRIGT AGRA.—Besides attending to the removal of vegetation, the arched causeway was, at places, pointed and underpinned.

161. MONUMENTS, FATEHPUR SIKRI, DISTRICT AGRA.—In continuation of the previous year's work in the Treasury building providing stone brackets and fixing of veneering stones in between them with the help of copper dowels, the work of restoring eaves in the east, south and west was completed and decayed and damaged stone pillars were replaced by new ones. The flooring of the side rooms and also the verandah on the south was completed. So far as the Mint house is concerned the domes were replastered, arches restored and the roof of the eastern wing relaid with fresh concrete. In the Naubat Khana, the masonry pillars built earlier, were replaced by sandstone pillars to match with the original. The flooring of the main entrance and shops of the imperial market was also attended. The missing veneering stones were replaced and the plaster of the ceiling and alcoves was restored, all these done in such a way so as to match with the original. Further, the domed structure to the east of the Treasury was pointed, plastered and sometimes edged. In the mosque, Shahi-darwaza and the Buland-darwaza, the work of restoring inlay work continued.

162. TOMB OF IBRAHIM, RASOOLPUR, DISTRICT AGRA.—The work of replastering the plinth and restoration of the southern wall were attended.

163. AKBAR'S TOMB, SIKANDRA, DISTRICT AGRA.—With the help of copper clamps the dislodged and broken brackets in the second and third floors were reset or replaced. At places the enclosure wall was also reconstructed.

164. GATEWAYS TO KATRA UMAR KHAN AND KATRA JOGI DASS, TAJGANJ, DISTRICT AGRA.—The out-of-plumb carved parapet-wall of the Katra Umar Khan was restored with *lakhauri* bricks and plastered with lime-mortar. Replastering was done in patches on the facades inner walls and ceilings after the removal of the decayed plaster.

At the Katra Jogi Dass, underpinning with *lakhauri* bricks was attended in patches, and recessed pointing done on the inner walls and on the outer facade.

165. GROUP OF TEMPLES, BAIJNATH, DISTRICT ALMORA.—The sunk foundation of the south-western side of the Kedarnath temple was grouted and provided with 60-cm thick concrete layer to check further seepage of water. Near the main shrine decayed stone slabs of the flooring were replaced by new ones.

The construction of retaining wall around the group of temples at Jageshwar was resumed and completed.

166. EXCAVATED SITE, AHICHCHHATRA, RAMNAGAR, DISTRICT BAREILLY.—Badly-under mined structures were strengthened and open joints pointed. Besides removing the vegetation, an approach road was also provided.

167. TOMB OF IKHLAS KHAN, BUDAUN, DISTRICT BUDAUN.—After the removal of vegetation, the flooring of the tomb was repaired.

168. TEMPLE, LAKHAMANDAL, DISTRICT DEHRA DUN.—A dry masonry wall was built with available local stones in order to protect the earth-filling in the foundation of the shed. A flight of steps was provided to have an easy access to the site.

169. MOSQUE AND TOMB OF MAKHDUM JAHANIA, KANAUJ, DISTRICT FARRUKHABAD.—The parapet and roof of the *kacheriwala* and *7,-a.nansi-gumbad* were laid with fresh concrete in order to stop percolation of water. Deep and wide cracks were grouted and pointed; dislodged stones in the arches were reset and pointed.

170. TOMB OF BALAPIR, KANAUJ, DISTRICT FARRUKHABAD.—The dislodged and sunken flooring of the tombs of Mohammad Mehdi and a part of Balapir was reset, and pointing done in the case of the latter.

171. TEMPLE, URWARA, DISTRICT HAMIRPUR.—Debris over the flat roof of the temple had been removed while the open joints of the plinth were pointed.

172. RAJA GANGADHARA RAO-KI-CHHATRI, JHANSI, DISTRICT JHANSI.—The moulded and carved lime-plaster was reproduced on the outer facade s of the compound wall, which was also subjected to recess-pointing. Stones of the flight of steps leading to the tank in front of the *chhatri* were replaced.

173. RANI LAKSHMI BAI PALACE, JHANSI, DISTRICT JHANSI.—The palace was colour-washed to match with the original, besides attending to minor plaster-work of the outer facade.

174. BRICK TEMPLE, NIBIA KHERA, DISTRICT KANPUR.—Joints on the facade were recess-pointed and cracks in the plinth grouted. Moreover, roofs of subsidiary shrines on the south west and north-west were water tightened.

175. GROUP OF TEMPLES, CHANDPUR, DISTRICT LALITPUR.—All the dislodged stones in the exposed plinths of the temples of Lakshminarayana and Varaha were reset and open joints pointed. Likewise the fallen members of the *sikhara* of the Varaha temple were reset in position.

176. KURAIYA BIR TEMPLE, DEOGARH, DISTRICT LALITPUR.— The plinth of the temple was exposed and the dislodged stones were reset. It was cleared of all rank vegetation.

177. JAMI-MASJID, HUSSAINABAD, LUCKNOW, DISTRICT LUCKNOW.—The plinth was subjected to underpinning at north-eastern and north-western corners and after the removal of vegetation replastering was done at places.

178. BARA IMAMBARA, LUCKNOW, DISTRICT LUCKNOW.—The work of reproducing the richly-carved, moulded and ornamental plaster on pillars and panels has been taken up. The vaulted ceiling of the north-eastern wing adjoining the second gateway was replastered after the removal of the decayed plaster. Even the floorings of the northern and eastern wings were relaid with concrete and the simple moulded plaster was restored on jambs, facades and inside walls.

179. BIBIAPUR HOUSE, LUCKNOW, DISTRIGT LUCKNOW.—T'he wooden staircase leading to the second storey has been strengthened and the collapsed roofs of the two small rooms were restored.

180. MOSQUE AT IMAMBARA AND IMAMBARA IN RESIDENCY, LUCKNOW, DISTRICT LUCKNOW.—Besides watertightening the walls and facades, the decayed flooring of the halls and galleries were relaid with lime-concrete.

181. MUSHIRZADI'S TOMB, LUCKNOW, DISTRICT LUCKNOW.—The decayed flooring of the central hall and the verandahs on the south and the west of the first floor was laid with fresh concrete flooring. The work of restoring fallen plasters of the facade was taken up and the work is in progress.

182. RUMI-DARWAZA, LUCKNOW, DISTRICT LUCKNOW.—After the removal of the dead plaster the vaulted ceiling of the second storey was replastered at places. The roof of the north western wing of the first floor and the southern wing of the second floor was relaid with concrete.

183. KANKALI TILA, MATHURA, DISTRICT MATHURA.—The tank exposed at the site was pointed. Further, two top corners were dismantled for resetting with lime-concrete to make them watertight.

184. TEMPLES, VRINDABAN, DISTRICT MATHURA.—At the Govinda Dev temple, joints of the facade were filled with cement mortar after the removal of vegetational growth. Here doors were repainted according to the original colour.

The compound wall of the Madan Mohan temple towards the river was underpinned with *lakhauri* bricks at the north-western corner. Several parts of the temple were subjected to watertightening after removing the vegetational growth.

Open joints of the temples of Radha-Vallabha and Jugal-Kishore were filled with cement mortar; vegetation was also removed.

NORTH-WESTERN CIRCLE

Haryana

185. FIROZSHAH FORT AND MOSQUE, HISSAR, DISTRICT HISSAR.—The dead lime-concrete of the roof of the palace inside the fort was removed and provided with fresh lime-cement concrete to watertighten the leaking roof.

Similarly, the decayed lime-concrete of some portions of the roof terrace of the Firozshah mosque was removed with a view to provide fresh cement-lime concrete. A fallen portion of the enclosure wall of the mosque was reconstructed with *lakhauri* brick-work in lime-*surkhi* mortar in conformity with the original.

186. GUJRI-MAHAL, HISSAR, DISTRICT HISSAR.—As a part of special repairs to this monument, fallen and bulged portions of the retaining wall from the right side were reconstructed. Random rubble masonry work in lime-*surkhi* mortar was also done to other small patches. Dead lime-concrete of the roof-entrance was removed to lay afresh lime-concrete matching the original. Sunk pointing of gate in lime-*surkhi* mortar was completed. Also, restoration of country brick-work in missing and dislodged patches of the Mahal was done.

187. MUGHAL-SARAI, GHARAUNDA, DISTRICT KARNAL.—The roof of the northern and southern gate of the *sarai* was watertightened by providing fresh lime-cement concrete with brick aggregate after removing the dead lime-concrete.

188. KABULI MOSQUE, PANIPAT, DISTRICT KARNAL.—The main dome of the mosque was plastered, in lime-cement mortar mixed with brick jelly, to match the original. This was done after removing the dead plaster and the roof was watertightened.

189. LODI'S GRAVE, PANIPAT, DISTRICT KARNAL.—The damaged and uneven brick-flooring of the grave was dismantled and country bricks on the edge were provided with proper slope in the flooring.

190. SHAIKH CHILLI'S TOMB, THANESAR, DISTRICT KURUKSHETRA.—To check seepage of water from the cells brick-work of the rear wall was plastered. The vaulted passage, which had developed many cracks, was partly dismantled and reconstructed as per the original. Further to reduce the load on the existing arch, an additional arch was provided over the existing one.

191. JAL-MAHAL, NARNAUL, DISTRICT MAHINDERGARH.—The fallen pillars and roof of the right side of the main gate was restored as per the original construction. Besides, the cracks which had developed on either side of the gate were stitched and stone-work repaired. Recessed-pointing was provided to match the original, while roofs of the gate-house were watertightened.

A rubble stone enclosure wall in lime-cement mortar was provided to prevent encroachment to the protected area of the Ibrahim Khan's tomb at Narnaul itself.

192. KHWAZA KHIZIR'S TOMB, SONEPAT, DISTRICT SONEPAT.—Lime-cement concrete apron was provided around the tomb to prevent seepage of water into the foundation of the monument.

Himachal Pradesh

193. BRIJESVARI AND CHAMUNDA DEVI TEMPLES, CHAMBA, DISTRICT CHAMBA.—The retaining wall of the back side of the Brijesvari temple which had developed cracks was repaired up to plinth level in stone work.

The fallen retaining wall of the Chamunda Devi temple has been reconstructed to prevent damage due to landslide.

194. SIVA TEMPLE, BAIJNATH, DISTRICT KANGRA.—The debris of the acquired structures and the land around the temple has been removed. To enclose the area and for the beautification of the surroundings a boundary wall with M. S. railing was provided.

195. FORT, KANGRA, DISTRICT KANGRA.—The retaining wall of the passage to the fort was repaired with stone masonry in conformity with the original.

196. BUDDHIST MONASTERIES, TABO, DISTRICT LAHUL AND SPITI.—Incomplete work of cement concrete flooring with colouring pigment was completed around the *pradakshina-patha* of the Duwang monastery. Wide and long cracks in walls of the Chamba Chibo gumpha were stitched with mud-bricks and the entire surface of outer walls were provided with fresh mud-plaster after scrapping the old plaster off (pl. LVII). Its leaking roof was also watertightened with alkathene sheets and fresh earth after removing the old earth.

197. BARSELA MONUMENT, MANDI, DISTRICT MANDI.—The accumulated earth at the entrance was removed so as to provide free access to the monument. The bulged out portions and fallen parts of the southern wall had been repaired with stone masonry in lime-cement mortar. To serve as the retaining wall and as preventive measure against landslide the height of the western wall was raised to 0-90 m.

198. PANCHVAKTRA AND TRILOKINATHA TEMPLES, MANDI, DISTRICT MANDI.—After the removal of the rank vegetation from outer surface of the walls, the entire Panchvaktra temple was washed chemically. The famous Trilokinatha temple was likewise chemically washed and all mossy elements, apart from vegetational growth, had been removed.

Jammu and Kashmir

199. ANCIENT TEMPLE, KAKAPORE, DISTRICT ANANTNAG.—Missing gaps of the southern and western sides of the enclosure wall were restored with stones, dressed by chiselling. Restored portion of the temple was pointed with cement-lime mortar matching with the original.

200. RUDRESVARA TEMPLE, LODU, DISTRICT ANANTNAG.—The topmost courses of the walls of this temple had become loose and even out-of-plumb. These were set right after dismantling followed by reconstruction. Furthermore, the walls were cleared of rubbish and flaked off chips. To check percolation the top was watertightened. Sunk pointing of joints of the stone-work with matching lime-cement mortar was carried out after removing encrustations. A causeway surfaced with *bajri* and sand was also made for approach to the sanctum.

201. ANCIENT TEMPLE, PAYAR, DISTRICT ANANTNAG.—Missing steps of the temple were restored with fine dressed stone blocks. Displaced stones of the *sikhara* was reset and floor repaired. Apart from repairing the stone frame of the door, recessed pointing was done on the stone work.

202. AKHUN MULLA SHAH MOSQUE, HARIPARBAT, DISTRICT SRINAGAR.—After the removal of dead and loose mortar, two inner cells were pointed with lime-cement-.*surkhi* mortar.

203. BUDDHIST SITE, HARWAN, DISTRICT SRINAGAR.—Debris consisting of huge boulders from the top sector of the site was cleared for reclamation of old structures. The apsidal shrine has been exposed to view.

204. KATHI-DARWAZA AND SANGEEN-DRAWAZA, SRINAGAR, DISTRICT SRINAGAR.—Fallen portions of the walls of the *darwaza* were restored with rubble work while stone slabs provided to veneer the lower part of the wall. Recess-pointing was also done on stone work. All these were executed in accordance with the original method of construction.

At Sangeen-darwaza, debris have been cleared from the verandahs on either side of the old *darwaza.* After raking out the joints of the stone work and careful washing, outer walls were pointed with cement-lime mortar.

205. ANCIENT GROUP OF TEMPLES, BABOR (MANWAL), DISTRICT UDHAMPUR.—The leaking roofs of Devi Bhagavati, Derra, Kala Dera I and Kala Dera II temples were watertightened to stop percolation of water. Besides, the collapsed walls of a *mandapa* of one of the temples had been repaired.

206. ANCIENT GROUP OF TEMPLES, KRIMCHI, DISTRICT UDHAMPUR.—Out-of-plumb and at places fallen retaining wall of the southern side of the Temple I was dismantled and exposed foundation was laid out with cement concrete. Similarly, the decayed and weathered stones of the *mandapa*--walls of Temple 2 were dismantled for reconstructing the walls. All the weathered pillars were replaced by the ones matching the original (pl. LVIII). The loose, dislodged and out-of-plumb stone work of the walls of Temple 3 was dismantled and walls reconstructed after replacing the decayed and weathered stone block (pl. LIX). After removing vegetational growth voids were filled in with liquid lime-cement mortar. The leaking roof of the tool-shed had also to be repaired.

207. PALACES AND OTHER MONUMENTS, RAMNAGAR, DISTRICT UDHAMPUR.—Two big rooms on the second floor of old palace were leaking during rains endangering the mural paintings. Both the roofs had been waterightened by laying fresh concrete over the existing roof.

A storm-water drain was provided to take out the rain water of the Palace-complex to prevent seepage into the structures of Nava-mahal.

At Nava-mahal the walls which had fallen or bulged out were reconstructed saving the floral paintings. In this work dressed stone masonry set in lime-cement mortar was recessed-pointed with *lime-surkki* mortar, the entire reconstruction matching nicely with the original.

The dead concrete of the pathways around the *samadhi* of queen of Raja Suchet Singh was removed to lay fresh cement-lime concrete in such a way as to match with the original.

Punjab

208. FORT, BHATINDA, DISTRICT BHATINDA.—A part of the inner bastion near the gate inside the fort was reconstructed, with *lakhauri* bricks, maintaining the original appearance. Uneven and damaged pathway, made of bricks, near the main entrance was repaired.

209. SHAMSHER KHAN'S TOMB, BATALA, DISTRICT GURDASPUR.—To stop grazing of cattle and other encroachments the area around was fenced with a barbed wire.

210. DAKHNI-SARAI AND KOS-MINAR, DAKHNI, DISTRICT JULLUNDUR.—The broken and fallen portions of the outer wall of the *sarai* and the mosque were repaired with *lakhauri-brick* masonry in lime-cement mortar (pl. LX).

The fallen patches of the *minar* and its platform were restored in conformity with the original construction.

SOUTHERN CIRCLE

Kerala

211. FORT ST. ANGELO, CANNANORE, DISTRICT CANNANORE.—The top of the south-east bastion was rendered watertight and missing stones of the top courses were made good with new laterite blocks cut to required dimension.

212. BEKAL FORT, PALLIKERE, DISTRICT CANNANORE.—For proper drainage of storm water from inside the fort a drain with covering slab was provided.

213. MATTANCHERRI PALACE, COCHIN, DISTRICT ERNAKULAM.—Granite slabs to serve as damp-proof course were inserted at the bottom of the eastern wall to cover the entire thickness of the wall.

214. ST. FRANCIS CHURCH, COCHIN, DISTRICT ERNAKULAM.—The roofing of the church was watertightened. Moreover, a portion of the damaged grill-work of the compound wall with the gate had been repaired and restored to its original condition.

215. FORT, PALGHAT, DISTRICT PALGHAT.—The work of underpinning of the decayed and fallen portions of the fort-wall continued. Besides the removal of vegetation, the top of the fort-wall was rendered watertight.

216. BURIAL CAVES, KAKKAD AND KATTAKAMPAL, DISTRICT TRICHUR.—Apart from clearing the sites of vegetation, proper approach pathways were laid and the surroundings improved.

217. SRI RAMASVAMI TEMPLE, TRIPRAYAR, DISTRICT TRICHUR.—The copper sheet covering the main shrine was given a coat of copper colour paint to protect the sheet from corrosion and to arrest leakage in the roof. All the wooden members of the main shrine and the *namaskara-mandapa* were treated with colourless wood preservative to arrest decay.

218. SANKARANARAYANA TEMPLE, TEN-KAILASANATHA TEMPLE-COMPLEX, TRICHUR, DISTRICT TRICHUR.—In order to stop decay the wooden members of the shrine were treated with colourless preservatives.

219. RAMA TEMPLE, KATAVALLUR, DISTRICT TRICHUR.—As a measure of protecting the wooden bracket figures, the leaking roof of the principal shrine was repaired by replacing the rotten wooden members by new ones.

Pondicherry

220. SVAYAMBHUNATHA TEMPLE, NEDUNGADU, KARAIKKAL.—The Tirumadil of the temple, which was in need of underpinning and plastering to prevent collapse, was attended.

221. PANCHANANDISVARA TEMPLE (OR VADUGIRISVARA TEMPLE), TIRUVANDARKOIL, PONDICHERRY.—To bring to light the original level of the area and providing proper slope for easy flow of rain water, the work of removing the earth outside the *prakara* has been taken up; the southern side has already been cleared.

Tamil Nadu

222. IRAVATANESVARA TEMPLE, KANCHIPURAM, DISTRICT CHINGLEPUT.—The fallen portions of *the prakara* on the southern side has been restored and the roof of the *mukha-mandapa* rendered watertight. In the entrance *mandapa* the accretionary wooden post, which was provided to support the ceiling in the place of fallen masonry wall, was removed after restoring the masonry wall while the roof terrace of the *mukha-mandapa* was rendered watertight.

223. KAILASANATHA TEMPLE, KANCHIPURAM, DISTRICT CHINGLEPUT.—The work of removing the accretionary plaster from over the sculptures of the mouldings was continued on the northern side of the main temple and the exposed portions were attended to by filling the masonry joints and finishing sculptures by careful modelling. Similarly, two sub-shrines of the *prakara* were also attended to by removing accretionary plaster and modelling work.

224. ARJUNA'S PENANCE (OLD), MAHABALIPURAM, DISTRICT CHINGLEPUT.—The gap between the top boulder and the mother rock was filled in and the cracks on the rock surface were pointed with suitable mortar, and the surface finished to match the old work.

225. SHORE TEMPLE, MAHABALIPURAM, DISTRICT CHINGLEPUT.—The dead and decayed mortar from masonry joints of the shrines of the Shore temple-complex, particularly the smaller temple facing west, was raked out and the resultant gaps have been filled with suitably tinted and textured mortar so as to match with the old stone surface (pl. LXI).

226. DHARMESVARA TEMPLE, MANIMANGALAM, DISTRICT CHINGLEPUT.—A portion of the fallen brick wall on the east and the south of the Amman shrine was restored. Grill-screen was provided for a portion inside the *maha-mandapa* for keeping the bronze image in safe custody.

227. MUKUNDASVAMI TEMPLE, PON-VILAINDA K.ALATHUR, DISTRICT CHINGLEPUT.—The leaky terrace of the covered circumambulatory passage around the Ammam shrine and the part of the *maha-mandapa* adjoining the same was watertightened by using brick jelly concrete, flat tiles and finishing the top with combination mortar.

228. DUTCH CEMETERY, PULICAT, DISTRICT CHINGLEPUT.—A number of inscribed and decorated tomb-slabs which were disturbed from the original position had been placed back in position and secured by edging. Similarly, the damaged brick work of some of the graves was attended by underpinning and plastering in patches (pl. LXII).

229. ATIRANACHANDA ROCK-CUT TEMPLE, SALUVANKUPPAM, DISTRICT CHINGLEPUT.—In order to protect the Chola inscription on the extended floor in front verandah of the Atiranachanda cave-temple from being trodden by visitors a low-level railing of suitable design, using aluminium square posts, was erected around it. Irregular and untidy flight of steps on either side of the cave was removed and instead a flight of new cut-stone steps provided.

230. TIGER-HEADED ROCK-CUT CAVE, SALUVANKUPPAM, DISTRICT CHINGLEPUT.—The damaged and partially-loosened stone revetment of the sunken court in front of the cave was removed and rebuilt after dressing the old stones. The rough flight of steps was replaced by a new one of cut-stone masonry.

231. KANTHALINGESVARA TEMPLE, TENNERI, DISTRICT CHINGLEPUT.—Its front *mandapa* had developed vertical cracks due to the penetration of roots of a pipal tree; as a result, it had gone completely out-of-plumb. The *mandapa* including the foundation course was dismantled after careful documentation. It is now restored to its original form, and the foundation suitably strengthened. The brick-work of the *vimana* equally suffered due to growth of vegetation and it has now been strengthened by grouting, underpinning and recess-pointing.

232. VAIKUNTHANATHA-PERUMAL TEMPLE, UTTARAMERUR, DISTRICT CHINGLEPUT.—In continuation of the previous year's work the dislodged and bulging inscribed stones of the south face of the *adhishthana* were carefully removed and restored to their original position after strengthening the core (pl. LXIII). In addition, the pillared *mandapa* in front of the shrine was attended by relieving the same of the accretionary brick walls, removing the broken ceiling slabs and replacing them with new ones after putting the leaning pillars in plumb and water-tightening its roof (pl. LXIV). Further, the raised flooring over the *adhishthana* and the shrine was removed, lowered and relaid into two levels as per the original, using flagstones set on stone-jelly concrete. In the process, the *upana* mouldings were brought to light.

233. CLIVE'S BUILDINGS, FORT ST. GEORGE, MADRAS, DISTRICT MADRAS.—The portion housing the Pay and Accounts Office had its decayed plaster removed from walls, followed by replastering in combination mortar. Likewise, the portion housing the office of Temple Survey Project (Southern Region) was attended by white and colour-washing, and fitting of expanded metal screens in window openings to prevent monkeys from getting in. The water-supply to the Photo-Section of the Circle was augmented by a new bore-well.

234. ST. MARY'S CHURCH, FORT ST. GEORGE, MADRAS, DISTRICT MADRAS.—The decayed wooden joists of the ceiling of the aisles were replaced by new ones, and the leaky terrace of the nave was watertightened by using brick-jelly concrete in lime over which two layers of flat tiles were laid and the top plastered and finished with combination mortar. Pipes meant for the flow of rain water from the roof were choked up and these were removed and replaced after clearing the passage.

235. DELHI GATE, ARCOT, DISTRICT NORTH ARCOT.—The choked underground drain was re-commissioned by removing the blockade caused by earth-accumulation. Patch-plastering of the outer wall in combination mortar was also attended.

236. MASJID AND TWO PONDS, ARCOT, DISTRICT NORTH ARCOT.—The damaged and collapsed sections of the approach flight of steps leading to the larger pond in front of the Masjid were restored by using the same *lakhauri* bricks in combination mortar.

237. CHANDRAMAULISVARA TEMPLE, NATTERY, DISTRICT NORTH ARCOT.—Fallen debris and accumulation of earth against the *prakara* wall were removed by careful clearance in order to bring the outer face of the *prakara* up to the plinth-level to view and expose the inscriptions thereon. Two small shrines, the existence of which was not known so far, were brought to light.

238. JAINA TEMPLE, TIRUMALAI, DISTRICT NORTH ARCOT.—The masonry flight of steps leading to the Santinatha temple in the first terrace was dismantled and rebuilt to expose the hidden portion of the inscribed moulding as well as the choked drain. In the course of this operation three new Chola inscriptions were discovered.

239. KONAR TEMPLE, TIRUMALPUR, DISTRICT NORTH ARCOT.—The sunken stone flooring inside the temple was removed and reset by using the old stone, to the extent available, supplemented by new stones wherever necessary.

240. VELLORE FORT AND JALAKANTHESVARA TEMPLE, VELLORE, DISTRICT NORTH ARCOT.—The upper portion of the fort wall on the north-eastern side was rendered watertight by laying stone-jelly concrete and finishing the top with a neat coat of mortar. The work of providing barbed-wire fencing to enclose the protected area around the temple is in progress.

The loose sculptures which were placed in the cloister of the Jalakanthesvara temple have been removed for rearranging them on masonry pedestal in the closed *mandapa* on the south-eastern corner. Sculptures are being provided with labels.

241. SUNDARESVARA TEMPLE, TIRUKKATTALAI, DISTRICT PUDUKKOTTAI.—Buried Stone pillars and stone beams were stacked neatly inside the temple premises after levelling the ground. Undulated stone flooring of the main shrine and the Amman shrine was reset.

242. CAVE-TEMPLE, KUNNAKUDI, DISTRICT RAMANATHAPURAM.—The cracked stone-beam in the front-*mandapa* was replaced with new one and the terrace watertightened. Thick coat of lime on the walls and pillars was removed.

243. FORT, ATTUR, DISTRICT SALEM.—The ramp of the tort in front of the granary, which was severely eroded due to heavy rains, was provided with stone pitching and joints pointed with combination mortar. In the granary the damaged portions of the wall were underpinned and plastered and the sides of the doors grouted.

The damaged steps leading to the terrace of the granary were repaired and properly strengthened, and the frontage of the granary tidied up by providing 100-mm thick gravel with proper consolidation.

244. FORT, GINGEE, DISTRICT SOUTH ARGOT.—In continuation of the previous year's work, fallen portions of the outer wall was restored. The work comprised core filling and erecting of veneer stones both on the interior and exterior faces to match with the original features.

The weathered and broken portions of the *chhajjas* on the northern side of the sixth and seventh storeys of the Kalyana-mahal were repaired in conformity with the old features.

In the Kamalakkanni Amman temple, the broken ceiling slab was replaced with new one inside the *mandapa* and the terrace watertightened. The approach pathway was gravelled.

The front structural *mandapa* of the rock-cut Siva temple on the Krishnagiri rampart wall was attended by restoration of one of the out-of-plumb walls after dismantling. Watertightening of the roof and providing stone flooring were other items attended here (pl. LXV).

The leaning portion of the front *mandapa* of the Ranganatha temple on the Rajagiri of the Gingee fort was taken down and reset after relieving the same of accretionary brick wall.

Structural repairs comprising dismantling of cracked and out-of-plumb southern wall of the main shrine and restoring the same to the plumb was undertaken for the Siva temple at Gingee.

245. VENKATARAMA TEMPLE, GINGEE, DISTRICT SOUTH ARGOT.—In continuation of the work of the previous year, the work of removing the masonry buttresses provided in place of pillars in order to replace them by the salvaged ones from the debris was continued in the multi-pillared hall in the outer *prakara.* In the *7nandapa,* on the north-eastern corner of the outer *prakara,* the work was continued by dismantling the ceiling slabs and roofing materials over them. Now the work of restoring the ceiling slab after putting the out-of-plumb pillars and walls in position has been taken up.

The ceiling of the *cloister-mandapa* on the southern and south-eastern corners of the outer *prakara* was rendered watertight after replacing the broken slabs of the ceiling and fallen *chhajja* stones (pl. LXVI). The *mandapalli* in the inner *prakara* was conditioned to serve as stores and, at the same time, to prevent misuse of the same by undesirable elements. In the multi-pillared *mandapa,* the floor was provided with flagstone wherever there existed gaps. A portion of the open area beyond the sunken forecourt was levelled and consolidated after spreading gravel to serve as car-park.

246. TALAGIRISVARA TEMPLE, PANAMALAI, DISTRICT SOUTH ARGOT. — The undulated flooring of the *yagasala* and *maha-mandapa* was removed and relaid evenly to conform with the original. The terrace of the *mandapa* was watertightened.

247. AIRAVATESVARA TEMPLE, DARASURAM, DISTRICT THANJAVUR.—The brick parapet wall of the *mandapa* of the cloister, which had constructional defects, was removed and also redone to match with the original pattern of construction, the clues of which arc available in

certain parts. The work of cleaning and removing the thick lime-wash coat from the walls, ceilings and pillars of the *alankara-mandapa* and other portions of the temple continued. The sides and floor of the sunken court of the *nandi-mandapa* in front of the *gopura* were provided with stone-pitching and flooring in order to prevent the drain getting choked with earth and silt.

248. BRIHADISVARA TEMPLE, THANJAVUR, DISTRICT THANJAVUR.—In continuation of previous year's work, cleaning and removing the thick coat of lime from walls, pillars and ceiling of the main temple had been continued. Similarly, the work of removing the moss and lichen from *gopuras, vimanas* and of sub-shrine was continued, besides rendering them watertight by filling the voids after taking due care to ensure the safety of stucco figures. The outer face of the walls of the Amman shrine was attended by removing the flush-pointing from the walls and by recess-pointing the masonry joints. In order to provide an independent access to the *karana*-gallery an iron ladder was provided on the southern side of the *maha-mandapa.*

249. BRIHADISVARA TEMPLE, GANGAIKONDACHOLAPURAM, DISTRICT TIRUCHCHIRAPPALI.-Here also the work of cleaning and removing the thick coat of lime from walls, sculptures (pl. LXVII), pillars and ceiling of the main temple was continued. Likewise, the work of removing the moss and lichen from the *gopuras* and *sikharas* of the sub-shrines and making them watertight by filling the voids is in progress; due care was taken to protect the stucco figures from getting damaged.

The brick masonry of the outer face of the well was underpinned with country bricks in combination mortar. The damaged platform adjoining the well was attended by replastering in combination mortar.

250. FORT RANJANGUDI, DISTRICT TIRUCHCHIRAPPALLI.-—As a measure of safety, grill-screens were provided in the opening on the top of the fort-wall.

251. SRI VALISVARA TEMPLE, TIRUVALISWARAM, DISTRICT TIRUNELVELI.—The undulated stone flooring inside the temple was reset. To give the temple a neat and tidy appearance the accumulated earth was removed and levelled.

SOUTH-EASTERN CIRCLE

Andhra Pradesh

252. SIDDHESVARASVAMI TEMPLE, HEMAVATI, DISTRICT ANANTAPUR.—Besides minor repairs to the roof of the *mandapa,* the compound wall was repaired.

253. VIRUPAKSHASVAMI TEMPLE, HEMAVATI, DISTRICT ANANTAPUR.—Clearing of accumulated debris made it possible to drain out effectively the rain water from the compound of the temple.

254. VIRABHADRASVAMI TEMPLE, LEPAKSHI, DISTRICT ANANTAPUR.—The old tabloid surfacing over the *mandapa* of the Virabhadrasvami shrine which was cracked and disjointed from the roof is removed. A layer of pressed flat tiles in coloured mortar was spread and the roof watertightened to protect the famous murals on the ceiling. In place of old damaged doors, new ones in teak wood, suited to the temple, were provided. The work of flood-lighting the temple is in progress.

255. FORT AND MAHALS, CHANDRAGIRI, DISTRICT CHITTOOR.—As a result of clearance of debris, buried remains of a palace-complex in the premises of the Rani-mahal had been exposed.

256. FORT AND MAHAL, GURRAMKONDA, DISTRICT CHITTOOR.—Damaged *chhajjas* around the Mahal were restored in old styles.

257. CHENNAKESAVASVAMI TEMPLE, SOMPALLI, DISTRICT CHITTOOR.—To prevent encroachments, the protected area is fenced with barbed-wire on iron posts.

258. VAIDYANATHASVAMI GROUP OF TEMPLES, PUSHPAGIRI, DISTRICT CUDDAPAH.—The damaged and sunken old flooring of the *mandapas* was relaid to prevent soakage of rain water. With two coats of plastering in combination mortar, the roofs of the *mandapas* were watertightened. Loose sculptures available in this temple-complex were fixed on suitable pedestal for purpose of security. As a result of removal of the accumulated earth and drifted sand, the buried basal mouldings came to light. To prevent accumulation of water in the temple-compound, effective drainage arrangement was made.

259. BHIMESVARASVAMI TEMPLE, DRAKSHARAMA, DISTRICT GODAVARI.—The leaky roofs of the *mandapas* were watertightened and the surface plastered.

260. KAPOTESVARASVAMI TEMPLE, CHEJERALA, DISTRICT GUNTUR.—The *prakara-wall* was reconstructed wherever found damaged. A tubular iron gate with grill was fixed to prevent entry of cattle.

261. CHOLA TEMPLE, MOTUPALLI, DISTRICT GUNTUR.—It was enclosed by barbed-wire fencing with an entry-gate into the temple.

262. FORT, GOLCONDA, DISTRICT HYDERABAD.—The original flooring of Silaikhana ^Ammunition store) was reset and plastered. Exposed top of the walls was watertightened and wall, with rough stone, pointed in lime-mortar to match with the original. The fortifications of the palace-complex known as Balahissar were taken up for conservation; the cyclopean walls have been pointed in combination mortar after raking out joints and finishing with matching tone. The original coloured enamel work on the stucco was exposed after the removal of the thick coats of lime-wash. The mortuary bath was also repaired.

263. CHARMINAR, HYDERABAD, DISTRICT HYDERABAD.—The stucco mouldings in the form of petals, flowers, creepers and the like over the arches in the ground floor on the exteriors of the *minars* and of the first and the second floors were repaired in specially-ground combination mortar. It could be attended to only after the erection of specialized type of scafflolding.

264. AKKANNA-MADANNA CAVES, VIJAYAWADA, DISTRICT KRISHNA.— Deep cavities and depressions on the roof caused stagnation of water inside the caves through seepage and percolation. These cavities etc., have now been filled up with layers of matching stone-works alter suitably grouting the major cracks.

265. ABDUL WAHAB KHAN'S TOMB, KURNOOL, DISTRICT KURNOOL.—To prevent erosion of earth a retaining wall with rough stone, placed in mortar, was raised towards the river side. It will protect also the cells on the river side during the time of flood. The arched openings of the tomb were closed with iron grills to prevent misuse.

266. WARANGAL FORT, WARANGAL, DISTRICT WARANGAL.—The area of the gateways and the Svayambhunatha temple-complex of the Kakatiya times was fenced with bared wire as a precaution against pilferage of loose sculptures.

SOUTH-WESTERN CIRCLE

Maharashtra

267. FARAH-BAGH PALACE, AHMADNAGAR, DISTRICT AHMADNAGAR.—Chunks of loose, decayed plaster which had fallen down from walls, niches and arches have been repaired in conformity with the original. Repairs were carried out also to cornices of different structures.

268. MONUMENTS, GHOTAN, DISTRICT AHMADNAGAR.—Cracked lintels and beams of the *garbha-griha* and *sabha-mandapa* of the Mallikarjuna temple, Bali temple and Jata-sankar temple were strengthened and supported by concealed angle-iron posts and M. S. girders. Disturbed stone slabs of the flooring of the temple were properly reset. The temple-tops were watertightened by excavating the loose portions and laying cement concrete over it. Stone pavement was provided around the temple to prevent stagnation and proper drainage of rain water.

269. ROCK-CUT CAVES, AJANTA, DISTRICT AURANGABAD.—The spongy rock over the facade of Caves 9, 11 and 21 to 26 had been chiselled and portions were projected in R.C.C. so that rain water does not flow inside the caves (pl. LXVIII). Besides, the collapsed portion of the supporting wall of the top drain of Cave 1 was redone as per the original.

270. BIBI-KA-MAQBARA, AURANGABAD, DISTRICT AURANGABAD.—Portions wherefrom chunks of plaster had fallen down from the north Baradari, corner *burj,* enclosure walls (inner and outer) towards north, south etc. have been repaired in accordance with the original (pl. LXIX). Moreover, cornices of different structures were also repaired. As a part of develop ment of the landscape the debris towards the eastern side of Maqbara was cleared off and a garden laid out.

271. ROCK-CUT CAVES, AURANGABAD, DISTRICT AURANGABAD.—The modern ashlar masonry pillars in Cave 4 were replaced by ones made in R.C.C. and these conform in colour and texture with the original ones.

272. DAULATABAD FORT, DAULATABAD, ' DISTRICT AURANGABAD.—Missing stone pillars in the Hemadpanti temple inside the fort were restored in R.C.C. simulating the original ones in texture, form and colour. Cracked beams and lintels inside the temple were strengthened by means of concealed angle-iron posts and M. S. girders.

273. ROCK-CUT CAVES, ELLORA, DISTRICT AURANGABAD.—The modern ashlar stone masonry pillars alongside the missing ones in Caves 19, 27, 34 etc., were replaced or built afresh as the case may be, in R.C.C. to match with the original colour and texture. That part of the *dhvaja-stambha* which collapsed is being reset in its original place. With a view to locating the source of leakage of rain water, the loose and decaying portion of rock on the top of Cave 14 was chiselled and debris cleared off. After careful examination, a rock-cut drain was provided while cracks and crevices sealed in cement mortar to stop seepage of rain water during monsoon.

274. CHHATRA, LONAR, DISTRICT BULDHANA—The debris from in and around the monument was removed to bring to light the origional features.

275. ELEPHANTA CAVES, GHARAPURI, DISTRICT KOLABA.—The work of providing terrace wall from the Cave no. 1 to the visitor's pavilion to avoid further-erosion of soil and to reclaim more land for easy movement has been completed and the same work of constructing terrace wall from Caves 2 to 4 is taken up and is in progress.

276. RAIGAD FORT, RAIGAD, DISTRICT KOLABA.—During the monsoon the roofs of the Jagadisvara temple, Nagarkhana, Dharmasala at the Raigad fort had been leaking and these have been watertightened by the application of bitumen compound.

277. PANDULENA CAVES, NASIK, DISTRICT NASIK.—The decayed, weathered and disintegrated portions of the pillars in Caves 4, 7 and 16 were chiselled and these, apart from the missing pillars, were restored to their original form. To avoid stagnation of rain water the approach paths leading to Caves 22 to 24 were relaid in cement concrete. Due to the accumulation of debris the drain on the top of the caves had not been functioning properly; as a result, rain water was flowing down the facades. This could be rectified after the clearance of the debris; the approach path was also maintained properly.

278. SHANWARWADA, PUNE, DISTRICT PUNE.—In place of the present G. I. pipe, the lathe-turned wooden railing as per the original pattern and design was provided around the *pushkarini.* The decayed and loose plaster of Chiman-bagh was chiselled and redone in conformity with the original.

279. CAVES, PANHALE KAZI, DAPOLI TALUK, DISTRICT RATNAGIRI.—To bring out the original features of the group of the caves the debris on the top of the caves was removed. Loose sculptures discovered in the course of debris-clearance have been displayed inside the caves properly.

280. BASSEIN FORT, BASSEIN, DISTRICT THANE.—Thick growth of vegetation on the top of the fortification walls and gates was cleaned and debris around the walls removed.

WESTERN CIRCLE

Goa, Daman and Diu

281. CHURCH OF LADY REMEDIOS, DAMAN.—The spongy plaster on the walls was removed and replastering carried out. Thick vegetation on the fort-walls of Moti Daman and Nani Daman was cleaned; trees on the roofs were treated with tree-killer. Further, crevices were filled in with mortar.

Gujarat

282. MALIK ALAM MOSQUE, AHMADABAD.—Cornices, merlons and decorated *jalis,* requiring repairs, were replaced by new ones giving the same texture of the stone as that of the original.

283. SARANGPUR GATE, AHMADABAD, DISTRICT AHMADABAD.—This gate was in advanced stage of decay, with many stone-members developing cracks. Such stones were replaced maintaining the old character of the monument. Repairs to pillars, capitals, lintels and arches

were also carried out. Iron girders supporting the roof were dispensed with and the roof was restored by laying stone slabs and lime concrete.

284. SMALL STONE MOSQUE, PALDI, DISTRICT AHMADABAD.—In continuation of the last year's work the missing steps of stone, nicely chiselled, were provided and the landing and other masonry components restored.

285. DWARKADHISH TEMPLE, DWARKA, DISTRICT JAMNAGAR.—The badly-weathered ashlar masonry of the main wall of the southern gate is being replaced by new ones of the same colour and texture.

286. RUKMINI TEMPLE, DWARKA, DISTRICT JAMNAGAR.—Removing the decayed and weathered stones from the plinth of the temple and resetting by new ones, duly chiselled and carved as per the original were carried out (pl. LXX).

287. KANKESVARA MAHADEVA TEMPLE, VASAI, DISTRICT JAMNAGAR.—Loose stone members of the temple such as lintels, pillars and capitals were arranged properly, and due to the clearance of debris the original flooring was fully exposed. The fallen compound wall, was repaired.

288. RANI-KI-VAV, PATAN, DISTRICT MAHESANA.—The work of restoration of fallen masonry, which was held up due to the flooding of the well by rain water is now in progress.

289. MAHADEVA TEMPLE, BAVKA, DISTRICT PANCH MAHALS.—Sunken portions of the plinth and *sabha-mandapa* were taken down and then reset after strengthening the foundation by underpinning.

290. EXCAVATED SITE, CHAMPANER, DISTRICT PANCH MAHALS.—A part of the excavated site had been cleared and levelled, and floors and missing stones were reset. Besides resetting the plaster and watertightening the top-layers, the bases of the pillars were strengthened and pointing carried out.

291. BAWAMAN'S MOSQUE, PAVAGARH, DISTRICT PANCH MAHALS.—Arches and domes of the north-eastern corner were badly affected and the structure got disjointed. Now these have been restored after dismantling the structure systematically (pl. LXXI).

292. RATNESVARA MAHADEVA TEMPLE, RATANPUR, DISTRICT PANCH MAHALS.—All the bulged out portions of the ashlar masonry were dismantled and restored as per the original after strengthening the foundation. Further, *torana-arch* was strengthened by fixing the missing parts.

293. NAVLAKHA TEMPLE, SEJAKPUR, DISTRICT SURENDRANAGAR.—The tiled *mandapa* was underpinned all round and ashlar members carved out as per the original.

Rajasthan

294. SAHELI BAZAR, AJMER, DISTRICT AJMER.—This monument is at a lower level than the Anasagar and is being misused badly. Its masonry walls, arches, etc., were in decayed condition and these were restored by plastering, pointing and by clearing the surroundings.

295. GROUPS OF TEMPLES, ARTHUNA, DISTRICT BANSWARA.—The roof of the *sabha-mandapa* of the Nilakantha Mahadeva temple and its pillars, capitals, etc., which were in damaged condition were dismantled and restored. Wherever there were missing members, the same were provided in conformity with the original size and pattern. The roof was concreted and watertightened (pl. LXXII).

In Siva temple no. 3, dismantling of loose hanging portions of various members of the masonry were done, followed by reconstruction. These works pertain to the *sabha-mandapa* and the temple outside.

The Siva temple in the Nilakantha Mahadeva group was similarly taken up for conservation. Stone members of the ashlar masonry were dismantled and then restored as per the original character of the monument.

296. CHITTAURGARH FORT, CHITTAURGARH, DISTRICT CHITTAURGARH.—In this fort-complex many monuments were taken up for repairs which included items like repairs to steps of the tank, pillars, roofs, lintels, etc. Noteworthy monuments where repairs were carried out are Topkhana building, Badi pole, Bhimlat tank, Tripolia gate (pl. LXXIII) and so on.

297. MONASTERY, MENAL, DISTRICT CHITTAURGARH.—Removal of dead concrete of the roof, broken, tilted or hanging portions of the masonry of different parts of the monument had been done with the purpose of restoring them as per original character of the monument.

298. KUMBHALGARH FORT, KUMBHALGARH, DISTRICT UDAIPUR.—Of the monuments taken up for preservation inside the fort mention may be made of the Badal-mahal, Prithviraj *chhatri,* Jaina temple 3 and Golerao temple. Repairs included removal of spongy concrete of roof, relaying concrete for watertightening, removal of bulged portion of masonry and reconstructing with the same old stones, removing the stone flooring and relaying with proper slope and filling in missing portions and setting right the flights of steps. At the Badal-mahal, wooden portions were treated with preservative coats besides providing the lighting conductor/ arrester.

MONUMENTS MAINTAINED BY THE STATES

ASSAM

1. NANDI-MANDAPA, SIV-TILLA, SONAI, DISTRICT CACHAR.—All vegetational growth on this monument, which is one of the ten taken up for repairs by the State Department, has been removed and the entire structure brought back to its original form.

GUJARAT

The Directorate of Archaeology took up special or general repairs at ten archaeological monuments or sites, of which the following worth special mention.—

2. FIRANGI TEMPLE, KALSAR, DISTRICT BHAVNAGAR.—The high plinth of the temple, one of the best pre-Chalukyan temples of Gujarat, and low road-level made it difficult to enter into it; hence, a flight of steps has now been provided.

3. NAVALAKHA TEMPLE, GHUMALI, DISTRICT JAMNAGAR.—In continuation of the last season's work the walls of *the jagati* were dismantled course by course and then reset in original position.

4. EXCAVATED SITE, NAGAR, DISTRICT JUNAGADH.—To protect the excavated remains against rain and other phenomena, these were covered up with grass and earth. Moreover, a barbed-wire fencing was also provided.

5. RAM-KUND, BHUJ, DISTRICT KUTCH.—Owing to heavy rain the adjacent area subsided, thereby resulting in the collapse of the eastern wall-face. This has now been rectified. Apart from clearing the debris, the area was fenced.

6. VADI-MEDI, MANJAL, DISTRICT KUTCH.—This temple also known as Saiva-matha is a storeyed pillared structure which suffered damage in the earthquake of 1819. Two upper courses of stones of the *jagati* which were missing and much of the displaced masonry work have now been reset. Repairs were carried out also to the Punerisvara temple at Manjal.

7. KALESVARI GROUP, LAVANA, DISTRICT PANCH MAHALS.—A barbed-wire fencing was provided here. Some works were carried out at the Ghumat-Valun-mandir as well.

8. STEP-WELL, CHORIVAD, DISTRICT SABAR KANTHA.—It was protected by a barbed-wire fencing.

9. SIVA-PANCHAYATANA TEMPLE, ABHAPUR, DISTRICT SABAR KANTHA.—The missing flooring stones were replaced by slabs, made out of cement and sand, but giving them the original colour and texture. Some works were carried out at the site of *Kunda* with a temple, besides providing barbed-wire fencing around the Sarnesvara temple here.

KARNATAKA

The Conservation wing of the Department of Archaeology and Museums carried out preservation-works at the following sites.—

10. RAMADEVARU TEMPLE, KUDLUR, DISTRICT BANGALORE.

11. BASAVAKALYAN FORT, DISTRICT BIDAR,

12. SRI CHANNAKESAVA TEMPLE, MARLE, DISTRICT CHIKMAGALUR.

13. SRI SIDDHESVARA TEMPLE, MARLE, DISTRICT CHIKMAGALUR.

14. SRI PRASANNA SOMESVARA TEMPLE, MULABAGAL, DISTRICT KOLAR.

15. SRI CHANNAKESAVA TEMPLE, DHARMPURA, DISTRICT MYSORE.

16. TRIKUTA BASTI, CHIKAHANASOGE, DISTRICT MYSORE.

17. LAKSHMIKANTHA TEMPLE, KALALE, DISTRICT MYSORE.

18. SRI LAKSHMINARASIMHASVAMI TEMPLE, BHADRAVATI, DISTRICT SHIMOGA.

MAHARASHTRA

19. WELL, NAGARDHAN FORT, NAGARDHAN, DISTRICT NAGPUR.

ORISSA

The State Department of Archaeology carried out conservation at the following sites, besides initiating works at the Kanakesvara group of temples, Kualo in District Dhenkanal, Patalesvara group of temples, Theru Valley, District Koraput, Svarnajalesvara temple at Bhubaneswar, Chandesvara temple at Chandeswar, excavated structure at Kurma, near Konarak, the last three being in District Puri.

20. INDRALATH TEMPLE, RANIPUR JHARIAL, DISTRICT BOLANGIR.

21. PANCHAPANDAVA TEMPLE, DHANISHA, DISTRICT CUTTACK.

22. TRILOCHANESVARA TEMPLE, KUNDESWAR BALIKUDA, DISTRICT CUTTACK.

23. MALLIKESVARA TEMPLE, PADMAPUR, DISTRICT KORAPUT.

24. LAKSHMINARAYANA TEMPLE, CHAURASI, DISTRICT PURL

PUNJAB

25. MAHARAJA RANJIT SINGH'S SUMMER PALACE, AMRITSAR, DISTRICT AMRITSAR. —Its ground floor has been preserved fully whereas the work in the first floor is in progress.

26. MUGHAL SARAI, DORAHA, DISTRICT LUDHIANA.—The removal of debris and vegetation is in progress. It has now been possible to trace the original road connecting the two main gates.

27. QILLA ANDROON, PATIALA, DISTRICT PATIALA.—While the preservation of its main-entrace *(deodhi)* has been completed the work of conservation of the Moti-mahal and Zillo-khana is in progress. The site is now cleared of all debris and vegetation.

28. SHISH-MAHAL, PATIALA, DISTRICT PATIALA.—It has now been completely preserved by restoring the damaged *minakari-work* in plaster, filling in the open joints and cracks, finishing the wall, both on the exterior and interior, to match with the original, and replacing the damaged ceiling of the Mahal-palace.

29. MUGHAL SARAI, SHAMBHOO, DISTRICT PATIALA.—The preservation of its outer walls, *sarai-rooms* and mosque is in progress, while the Mughal type of landscaping inside the *sarai* has been completed.

30. AM KHAS BAGH, SIRHIND, DISTRICT PATIALA.—Its main tank, including steps and walls, has been conserved and the work in other buildings is in progress. The rest-house has also been preserved.

WEST BENGAL

Conservation work was carried out in about twenty-five monuments of which the following deserve special mention.

31. JAINA TEMPLE, DEULBHIRA, DISTRICT BANKURA.—Debris around this laterite temple is cleared while the plinth has been consolidated. Repairs were executed to the crumbling *sikhara,* which was also cleaned. Its main *amalaka* was restored.

32. SIVA TEMPLE, PANCHRA, DISTRICT BIRBHUM.—Following its protection the temple was cleared of all vegetation and the open joints had been filled in with mortar. The vacant space where the *amalaka* was placed has been watertightened. All these apart, *sikhara* and the porch with curvilinear roofs were chemically treated.

33. SIVA TEMPLE, RASA, DISTRICT BIRBHUM.—Trees and smaller plants were weeded out chemically although the removal of vegetation from *sikhara* involved partly its dismantling. Resetting of stone blocks in their respective alignment was carried out. Moreover, carvings were specially cleaned and preservatives applied. Joints were filled with required mortar and pointed. Also, the floor of the sanctum has been repaired.

34. OCTAGONAL SIVA TEMPLE, SUPUR, DISTRICT BIRBHUM.—Worn-out bricks inside the sanctum were replaced by bricks matching the original. Decayed portions were repaired and the walls duly coated to revive the old beauty of the shrine. All vegetation, moss and lichen were cleared of and terracotta plaques treated chemically followed by application of suitable preservatives.

35. MADAN-GOPAL TEMPLE, KULINGRAM, DISTRICT BURDWAN.—The plinth of this brick temple was strengthened and the tall curvilinear tower repaired and strengthened befittingly. Likewise, the *jagamohana* was repaired by pointing the open joints.

36. JAMI-MASJID, OLD MALDA, DISTRICT MALDA.—The mosque was repaired by water-tightening the roof, and the fissures on the large dome were stitched by grouting.

X. EXPEDITION OUTSIDE INDIA

PRESERVATION OF BUDDHIST SHRINES AT BAMIYAN, AFGHANISTAN

STRUCTURAL PRESERVATION.—In continuation of the last year's (1976-77, pp. 131-132) work, preservation to the rock-cut image of the Big Buddha and to the caves around (fig. 11) at Bamiyan in Afghanistan was resumed under the leadership of Shri R. Sengupta of the Survey. The work which was taken up as an Indo-Afghan joint project, under a bilateral Agreement, was completed during this year and the two Buddhist shrines were formally handed over to the Afghan Minister for Culture by the Minister for External Affairs.

During the year, the two wide cracks, on the right leg of the Big Buddha, which extended horizontally to the left side, were filled up after securing the cracked portion by rock-bolting. The overhanging portion of the right shoulder was consolidated by inserting a log of wood at the back, which was duly concealed with rubble packing in *cement-gutch* mortar. The loose portion under the right arm of the image was also strengthened by providing suitable supports in RCC work which was plastered with *cement-gutch* mortar, suitably tinted to simulate the rock surface. The extant stucco work of the upper garment of the image of the Big Buddha was consolidated *in gutch-lime* mortar mixed with wool as a binding material, as per the original. The restoration of the folds of the upper garment was done to a limited portion only where it was absolutely necessary for preservation. The horizontal cracks on the high ceiling were repaired and plastered. The covered passage, leading to the head of the Buddha, was damaged at several places. Its roof was restored and the steps were reconditioned. A big chunk of rock, above the passage on the right facade was found overhanging due to the collapse of the portion below it. The loose block of the rock was first secured with the solid rock by rock-bolting and thereafter the passage was restored to its original shape. The flow of snow-water falling on the facade had eroded a portion of the rock-ledge on the right side, with the result the water was flowing over the painted surface inside. To arrest further damage, a ledge in cement concrete, reinforced with MS rods was provided with a drip-course. The forecourt of the image of the Big Buddha was found higher by about 2 m, obstructing the view of the image from the valley. This obstructing portion was levelled properly with a reverse slope after ascertaining that no ancient structure existed below it. The entire image was thus preserved.

CHEMICAL PRESERVATION.—The arched portion and the side walls of the niche of the Big Buddha bear paintings representing floral designs, figures of Buddha in seated posture (pls. LXXIV and LXXV) and scenes from Jataka stories. The pigments used arc blue, yellow, green, brown and red. The paintings are executed on fine mud plaster. The folds of the robe of the Buddha image too bear some patches of red paintings. Due to ravages of time, exposure to dust bearing wind, the pigments have lost their lustre and the binding medium of the pigments had lost its tenacity causing loosening and flaking off of the pigments from the painted surface. Besides, minute cracks had also developed on the paintings, as the place is prone to earth tremors. As the niche is open on the one side, thick dust and dirt had covered the paintings due to dust bearing wind. Further, due to percolation of muddy water from the molten snow, thick deposits of mud streaks were noticed on the paintings at several places. Besides, accretion of soot and bulging of plaster due to detachment of ground were also noticed.

As a preliminary step, the paintings were made free from superficial accretions like dust and dirt by using soft bristled and feather brushes. Subsequently, the loosened pigments were consolidated by the application of polyvinyl acetate in toluene in varying (3 to 5 per cent) concentration. After fixing the loose pigments firmly to the ground, the painted area was cleaned

BAMIYAN, AFGHANISTAN: PLAN OF SHRINES AT GROUND LEVEL AROUND BIG BUDDHA

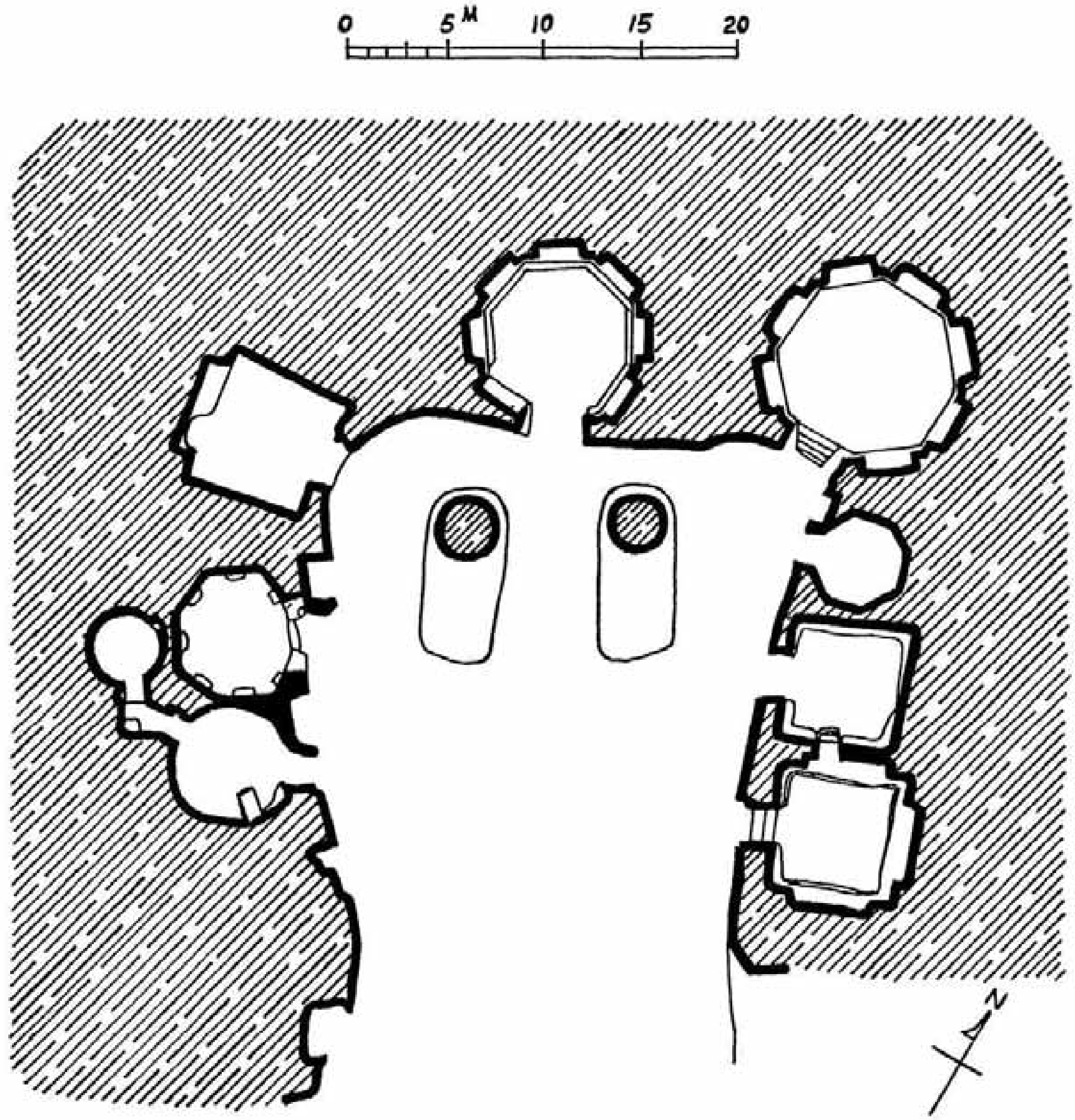


Fig. 11

with organic solvents like methyl alcohol, acetone, butyl alcohol, methyl ethyl ketone, etc., either using the solvent individually or combining two or three solvents as mixture, depending on the nature of accretions. The solvents were applied with the help of cotton swabs. Muddy accretions were removed by chemico-mechanical process, after softening the area with methyl alcohol. Soot deposits were removed by filter paper method, in which process the bits of filter paper, soaked in a mixture of triethanolamine with a little quantity of detergents, were gently pressed against the area to be cleaned of soot, until the filter paper absorbs the soot. The process was repeated until the details of the paintings were brought out. After the painted area was chemically cleaned, the paintings were preserved with a 3 per cent solution of polyvinyl acetate in toluene. Bulging portions were pressed back to the ground carefully after consolidation of the carrier by injecting plaster of Paris. Broken edges of the paintings were secured to the support by the filleting process.

The ceiling of Cave 8 at the ground level also contained beautiful floral designs in relief with bird motifs in stucco. The interior surface of the cave was having a thick deposit of soot probably due to the burning of the local grass and wood which on burning give out resinous and oily substance. These deposits were successfully removed by repeated application of 1 to 2 per cent solution of ammoniacal detergent in water and gentle scrubbing with soft nylon bristled brushes. This treatment brought to light the presence of beautiful bird motifs and floral designs, etc., in stucco work. After the treatment, the area was preserved with 4 to 5 per cent solution of methyl metha-acrylate (perspex) in toluene.

XI. ARCHAEOLOGICAL CHEMISTRY

TREATMENT OF MONUMENTS AND PAINTINGS[1]

ANDHRA PRADESH

1. VIRABHADRASVAMI TEMPLE, LEPAKSHI, DISTRICT ANANTAPUR.—Sculptures in different *mandapas* and exterior walls of the temple were treated by chemico-mechanical means for removal of moss and lichen, bands of red ochre coating, lime wash and brown water-marks; as a result, the original colours and carvings have come out nicely (pl. LXXVI A).

2. RAMAPPA TEMPLE, PALAMPET, DISTRICT WARANGAL.—In continuation of previous years' work a further area of about 990-00 sq m was chemically treated with the help of acqueous detergents, chemicals and organic solvents.

DELHI

3. RANG-MAHAL, RED FORT, DELHI.—Chemical treatment of the marble screen was continued for the removal of dirty stains and greasy deposits. Several detergents like Lissapol and Teepol were used for this purpose and hydrogen peroxide, alcohols, amylacetate, etc., were used for the treatment of stains.

4. SHAH-BURJ, RED FORT, DELHI.—The marble surface of Shah-burj was covered with moss and lichen and different kinds of stains. After the removal of moss and lichen with ammonia, cleaning of marble was done with the help of detergents like Teepol, Lissapol, etc. Stains were removed with the help of organic solvents such as toluene, xylene, pyridens, ether, acetone, carbon tetrachloride, etc. The chemically treated area was given a fungicidal treatment with 1 per cent zinc-silico-fluoride and a preservative coat of 3-5 per cent polyvinyl acetate solution in toluene.

5. TASBIH-KHANA, RED FORT, DELHI.—Chemical treatment of the marble surface and golden paintings was carried out with the help of detergents, organic solvents and mixtures of organic solvents. Care was exercised to see that the binding material is not affected during the process of treatment. The loose surface and pigments were consolidated with polyvinyl acetate while a preservative coat of 3 to 5 per cent polyvinyl acetate solution was applied. The work has almost been completed.

6. JAMALI-KAMALI MOSQUE, MEHRAULI, NEW DELHI.—The marble surface, which was covered with moss and lichen, smoke, ink and pencil marks was cleaned with the help of ammonia, organic solvents, hydrogen peroxide chloramine-T, tergitol, etc. After consolidating the loose surface, fungicidal treatment was given with 1 per cent zinc-silico-fluoride followed by a preservative coat of 3-5 per cent polyvinyl acetate solution in toluene.

7. ARAB-KI-SARAI, NIZAMUDDIN, NEW DELHI.—The loose tiles and detached surface on the exterior walls were fixed up with plaster of Paris. These surfaces coated with moss and lichen,

[1]Information from Director (Science) of the Chemistry Branch of the Survey, except items 44 and 45 received from Director of Archaeology, West Bengal.

dust and soot were cleaned with ammonia, organic solvents and their mixtures such as alcohols, ethers and.amines. The paintings in the interior were under thick lime wash. Besides fixing the detached surface with plaster of Paris, measures to consolidate it with polyvinyl acetate were also taken. Further, paintings were chemically treated with organic solvents and their mixtures. Stains were removed with hydrogen peroxide, chloramine T, tergitol, etc. The exposed surface was preserved with 3-5 per cent polyvinyl acetate solution in toluene.

GUJARAT

8. RANI SIPRI MOSQUE, AHMADABAD, DISTRICT AHMADABAD.—The stone was found to be covered with moss and lichen, soot, dirt and dust; some patches of salt accretions were also noticed. After cleaning, fungicidal treatment was given with a 3 per cent solution of zinc-silico-fluoride and then preserved with a 3 per cent solution of polyvinyl acetate in toluene. A small area of marble surface was chemically cleaned with a solution of Teepol containing a few drops of ammonia. Iron stains were removed with the help of 1 per cent solution of chloramine-T.

9. SUN TEMPLE, MODHERA, DISTRICT MAHESANA.—Chemical treatment for the removal of dust, dirt, bird droppings, moss and lichen, besides the salt extractions has been commenced.

HIMACHAL PRADESH

10. NARBADESVARA TEMPLE, SUJANPUR TIRA, DISTRICT HAMIRPUR.—The paintings, which were found to be covered with layers of dust, dirt, smoke and pencil marks, and the modelling work were treated chemically. The work will continue.

11. SERLANG GUMPHA, TABO, DISTRICT LAHUL AND SPITI.—Paintings marked by the use of different colours and abundance of gold have been covered with dirt, dust, mud and lime wash. Moreover, due to percolation of water, the mud streaks were noticed on some paintings. Beside, the colours of paintings were found to have been washed at a number of places and the binding material gone. All these paintings were treated very carefully with mixtures of acetone, diacetone, alcohol, benzene, pyridene, triethanolamine and other solvents (pl. LXXVI B). The works of chemical treatment, refixing the loose and detached plaster to the wall surface and photo-documentation have to be carried out further.

JAMMU AND KASHMIR

12. SHISH-MAHAL, RAMNAGAR, DISTRICT UDHAMPUR.—As a result of leakage in the roof mud-streaks were deposited on the paintings; layers of dust and dirt were also noticed over large areas. For chemical cleaning of these paintings normal organic solvents and Lissapol were used. Paintings treated chemically were preserved with 3 per cent polyvinyl acetate solution in toluene.

KARNATAKA

13. TIPU SULTAN'S PALACE, BANGALORE, DISTRICT BANGALORE.—In continuation of the last year's work *(1976-77,* p. 135) the plan for the removal of lime wash by chemico-mechanical means is being carried out successfully. To brighten up the paintings, these were treated with solvents like cellosolve, butyl lactate, diacetone alcohol, morpholine with a very small use of ammonia drops. Turpentine was used as an arrester. Consolidation of paint film was carried

out with 12 per cent polyvinyl acetate solution in toluene acetate mixture and the preserved with a few coatings of 3 per cent solution. Apart from the actual chemical treatment, modelling work was carried out for filleting of loose painted plaster, setting up of bulging portions, fixing up of cracks, holes, removal of nail scratches and chalk marks.

14. BADAMI CAVES, BADAMI, DISTRICT BIJAPUR.—The work in Caves 2 and 3 involved the removal of old preservative and the application of fresh preservative coating. After cleaning the surface, preservative coat was given with 2 per cent solution of polyvinyl acetate. About 75 per cent of the work has been completed.

15. PATTADAKKAL GROUP OF TEMPLES, PATTADAKKAL, DISTRICT BIJAPUR.—The work of chemical treatment has been initiated in the Jambulingesvara temple.

16. HOYSALESVARA TEMPLE, HALEBID, DISTRICT HASSAN.—The exterior of Santalesvara shrine as also the area between this and the shrine of Hoysalesvara, south-west and north-west flank of Hoysalesvara itself all being delicately sculptured were treated chemically. Beside the removal of moss and lichen, and lime wash, the sculptured surface was chemically treated with oxalic acid and deoxidine for the removal of brown and yellow obstrusive accretions respectively.

KERALA

17. MATTENCHERI PALACE, COCHIN, DISTRICT ERNAKULAM.—The murals depicting the *Ramayana* scenes and other themes were in good state of preservation earlier. However these have now been darkened due to aging along with the accumulation of soot, dust, etc. emitted day and night from the mechanized boats of the ferry service, and ships stationed at the nearby harbour. On the other hand, line drawings got hidden underneath a thick coat of lime wash. All the exposed murals were treated by removing old preservative with mixture of solvents namely toluene and acetone. Brightening up of the paintings was done with various solvents like cellosolve, diacetone alcohol, etc., while a fresh preservative solution of 3 per cent polyvinyl acetate in toluene acetone mixture was applied. Fine line-drawings depicting Krishna with a flute in the Thiruppanithuraiappan hall was exposed fully, and then consolidated and preserved. A few more panels were brought to light in the Ladies' chamber and in ladies' toilet.

MADHYA PRADESH

18. KHAJURAHO GROUP OF TEMPLES, KHAJURAHO, DISTRICT CHHATARPUR.—Chemical treatment for the removal of moss and lichen by ammoniacal water and lime coatings with diluted acetic acid in the temples of Adinatha and Parsvanatha was continued and further extended to the temples of Dula Deo, Chaturbhuja and Chitragupta. The work in the Parsva natha temple has been completed. Experimental work was done with paper pulp for the removal of salt accretion and application of thaltox Q as a fungicide. A plant harmone tafazine was also tried experimentally on Lakshman temple and Parsvanatha temple.

19. BAGH CAVES, BAGH, DISTRICT DHAR.—Experiment continued to expose hitherto unknown paintings in Cave 2 on the western and southern aisles, and wall, besides the south walls. Floral designs came out with the removal of various accretions. Cracks on the north and west aisles and the ceiling of the main hall were filled in and consolidation work is in progress.

In Cave 3 all the edges of the murals were given filletting, whereas in Cave 4 stripping was done of some portions of precariously hanging painted surface on the facade by refixing them to their resprective places by giving a new plaster background. Fumigation in Cave 3 was done with thylene dibromide as well as celphos; insecticides like D.D.V.P.; pyrethrum extract, forma-lene in proper proportion were injected into the holes having insect larva. Thereafter the holes were cleaned and filled in with suitable filler like plaster of Paris mixed with sythetic resin.

20. SANCHI STUPA, SANCHI, DISTRICT RAISEN.—Biological growth on railings and Buddha images were cleaned. The treatment was carried out with a plant harmone 2-4-D salt as herbicide and zinc-silico-fluoride as fungicide. The cleaned area was preserved with polyvinyl acetate solution.

MAHARASHTRA

21. ROCK-CUT CAVES, AJANTA, DISTRICT AURANGABAD.—In Caves 1, 2, 16 and 17 the spraying of insecticide solution like pyrethrum mixed with alcohol or kerosene oil, was carried out for the extermination of insects from the cells devoid of paintings. These insects cause irreparable damage to the binding medium and cellulose matter of the plaster carrying the paintings. In Cave 4 paintings reproduced and displayed by the Survey's artists were observed to be deteriorating. Steps were therefore taken to check their deterioration by spraying insecticide solution like pyrethrum and providing insecticidal atmosphere using para-di-chlrobenzene, etc.

In Cave 6 paintings (pl. LXXVII) were completely masked by thick deposits of varnish coats along with dust, dirt, soot and cement dust, etc. As a result of the removal of these accretions beautiful figures including those of Buddha, inscriptions in floral design have come out in bright colours. Photographic documentation continued side by side. In this Cave loose and bulged out painted and unpainted plaster was refixed to the ground, and to keep it in position adhesives were injected. Besides filleting the edges, the colour-matching of the filleted area was done.

In Cave 17, the work of chemical removal of old accretions of varnish coats over murals used for brightening up of the colour continued (pl. LXXVIII). These paintings were found to have been damaged due to seepage of water, dwelling of insects and bat nuisance. For removing the hardened varnishes and other accretions, organic solvent with varying solvent power were used in different proportion. Other chemical works comprised blanching effect on paint surface, refixing of loose plaster and colour matching of the filleted portions.

Apart from these chemical treatment, periodic cleaning of the caves was also carried out by way of removal of dust, dirt, cobwebs, wasp-nests etc. to avoid their accumulation or infiltration in cracks, tiny holes etc. On account of fluctuation in temperature and humidity there is a sudden drop in the velocity of wind and it causes deposition of dust and dirt on the paintings. Besides, these are brought by visitors who come in large numbers.

22. ROCK-CUT CAVES, ELLORA, DISTRICT AURANGABAD.—Due to thick growth of moss and lichen the colour and texture of the sculptures and carvings in the main temple of Kailasa underwent change. Further, beautiful paintings of the time of Ahalya Bai had been deteriorat ing because of atmospheric agencies. After the removal of vegetational growths, fungicidal treatment with zinc-silico-fluoride was carried out. Finally the treated area was preserved with polyvinyl acetate solution in toluene. Adhesives were injected into the loosened plaster, bearing paintings, and edges were filleted followed by the colour-matching of the filleted area. In Cave 21, the sculptures and ceiling in the north and south verandahs were treated chemically for removal of lime-coat, hard dust and dirt.

ORISSA

23. ANANTA-VASUDEVA TEMPLE, BHUBANESWAR, DISTRICT PURL—After the removal of moss and lichen with 2 per cent ammonia, fungicidal treatment with 2 per cent zinc-silico-fluoride was given followed by two preservative coats of 1-5 per cent to 2 per cent polymethyl methacrylate in toluene.

24. CHITRAKARNI TEMPLE, BHUBANESWAR, DISTRICT PURL—Chemical treatment and preservation by removal of moss and lichen from the subsidiary shrines on the south-eastern and south-western sides of this temple-complex were carried out. Wherever there was saline action, the area was rendered salt-free by paper-pulp method.

25. MEGHESVARA TEMPLE, BHUBANESWAR, DISTRICT PURL—Area treated chemically was given a preservative coat and the work of the removal of moss and lichen continued.

26. RAMESVARA TEMPLE, BHUBANESWAR, DISTRICT PURL—The chemical treatment involved the usual problem of removal of vegetation and soluble salts. The work on the spire of the *mandapa* has been completed.

27. SUN TEMPLE, KONARAK, DISTRICT PURL—The work of removal of moss and lichen with ammoniacal water from the ornate plinth (pl. LXXIX) on the northern and western sides has begun. Iron stains affecting the Surya image were removed by using 0.5 per cent oxalic acid solution. Beside, the friable stone of the pillared *natmandir* in front of the Sun temple was subjected to repeated treatments with paper pulp for the removal of injurious crystalline salts from its surface.

28. LORD JAGANNATHA TEMPLE, PURI, DISTRICT PURL—In the Jagannatha temple-complex, the sculptures were covered with thick layer of lime-mortar varying in thickness from 15.2 to 60.8 cm. After the removal of lime-plaster under the programme of structural conservation, the lingering layer sticking over sculptures was removed by application of 2 per cent aqueous acetic acid followed by thorough washing with salt-free water. The exposed area was given a fungicidal treatment with 1 to 5 per cent zinc-silico-fluoride and finally preserved with 2 per cent polymethyl methacrylate solution in toluene (pl. LXXX).

PUNJAB

29. MASTER MUSICIAN'S TOMB, NAKODAR, DISTRICT JULLUNDUR.—Chemical treatment for the removal of moss and lichen and application of the fungicide and preservative coats has taken up again.

RAJASTHAN

30. CHITRA-SALA, BUNDI, DISTRICT BUNDI—Accretions in the form of dust, dirt etc., on the murals were removed chemically by treatment with organic solvents like methyl alcohol, triethanolamine etc. The treated surface was preserved with 3 per cent polyvinyl acetate solution in Toluene.

31. JAGAT SIROMANI TEMPLE, AMER, DISTRICT JAIPUR.—The dust, dirt, moss and lichen on the carvings on gates, ceiling and pillars of the temple were removed by usual methods of chemical treatment.

TAMIL NADU

32. KAILASANATHA TEMPLE, KANCHIPURAM, DISTRICT CHINGLEPUT.—Chemical treatment for the removal of moss and lichen was completed in the eight sub-shrines in front, sub-shrines 1 to 29 and 30 to 58 inside the temple, Mahendravarmesvara shrine and the main temple. The paper-pulp treatment for the removal of soluble salts in respect of these shrines and sub-shrines has also been taken up.

A Somaskanda panel on the eastern wall of sub-shrine no. 43 and fully painted sculpture of Siva-Parvati in between the two sub-shrines on the north-western side were exposed and preserved. For existing paintings, exposed after removing the old preservative, the process of consolidation of paint film and painted plaster was carried out, besides the application of fresh preservative.

33. ROCK-OUT MONUMENTS, MAHABALIPURAM, DISTRICT CHINGLEPUT.—The vegetational growth, which recurred as a result of heavy rain, on the five *rathas,* the panel of Arjuna's penance, and Panchpandava-*mandapa* was removed with a view to restoring the original look.

34. BRIHADISVARA TEMPLE, GANGAIKONDACHOLAPURAM, DISTRICT THANJAVUR.—The chemical treatment and preservation works of the temple from *adhishthana* to the first *tala* have been initiated.

UTTAR PRADESH

35. ARAM BAGH, AGRA, DISTRICT AGRA.—The lime-covered paintings in the northern and southern *baradaries* have been exposed to view after the removal of plaster of varying thick ness. At some places only lime surface without paintings remains.

36. CHINI-KA-RAUZA, AGRA, DISTRICT AGRA.—After the removal of dirt, dust and other accretions on colourful tiles with ammonia and detergents, the surface was given fungicidal treatment and then preserved with 3 per cent polyvinyl acetate solution in toluene. The smoke-covered ceilings of corner rooms were treated with 1 per cent ammoniacal solution and triethanolamine.

37. TAJ-MAHAL, AGRA, DISTRICT AGRA.—The work of cleaning of three side-walls of the platform of the Taj was carried out for the removal of dust, dirt and yellowish stains with 1 per cent ammonical solution, Teepol and detergents. After this the treated surface was polished with colourless wax polish and burnished with soft cotton cloth.

38. HARAM-KI-SARAI, FATEHPUR-SIKRI, DISTRICT AGRA.—The exterior walls covered with dust, dirt, moss and lichen and other accretions were chemically cleaned with ammoniacal water using soft nylon brushes. The cleaned area was given the fungicidal treatment followed by preservative coat of 3 per cent polyvinyl acetate solution in toluene.

39. MARYAM PALACE, FATEHPUR-SIKRI, DISTRICT AGRA.—The paintings in the central room were chemically treated with suitable organic solvents and then preserved with polyvinyl acetate solution. Some of the flaking in one of the corner rooms is being attended too.

40. SHAIKH SALIM CHISHTI'S TOMB, FATEHPUR-SIKRI, DISTRICT AGRA.—The surface above Arabic inscriptions on the walls and the ceiling was treated chemically for the removal of dust,

dirt and soluble salts by the application of detergents and paper-pulp etc. The treated area has been preserved with 3 per cent polyvinyl acetate solution in toluene.

41. DHAMEK STUPA, SARNATH, DISTRICT VARANASI.—The carving of this important Buddhist structure had been exfoliating due to crystallization of soluble salts. To stop the deterioration, these salts were removed. Moreover, the deposition of moss and lichen, dust, dirt, soot, etc., was removed.

WEST BENGAL

42. LALJEE TEMPLE, BISHNUPUR, DISTRICT BANKURA.—Thick coats of soot, dirt and vegetational growth on the *sikhara* and four walls were cleaned with the help of ammonia, triethanolamine, detergents like Teepol and Lissapol, etc.

43. RADHEYSYAM TEMPLE, BISHNUPUR, DISTRICT BANKURA.—The use of various emulsifying agents like triethanolamine and Lissapol was made for the removal of accretions like moss and lichen, soot, dust and dirt from the *sikhara* and the terracotta plaques of the main entrance wall.

44. JAINA TEMPLE, DEULBHIRA, DISTRICT BANKURA.—The springing lion in laterite on the *sikhara* was found weathered and stained. This sculpture projecting from the turret was cleaned of stains and accretions by suitable alkalies and solvents. Finally, a coat of preservative was applied.

45. SIVA TEMPLE, KAMARPARA, DISTRICT BURDWAN.—Terracotta plaques affected by moss and lichen, besides the presence of injurious salts were treated with 5 per cent triethylamine. After thorough washing and later on drying, a coat of preservative solution of 6 per cent vinyl acetate was applied on the treated plaques. Similar chemical treatment was carried on the terracotta plaques of the Ratnesvara and Gangesvara temples, dedicated to Siva, in District Murshidabad.

46. LOTON MOSQUE, GAUR, DISTRICT MALDA.—The accretions of moss and lichen dust, dirt and soot had disfigured the polychrome enamel decoration. As a result of removal of the accretions with normal solvents these enamels have come to full view.

TREATMENT OF EXCAVATED OBJECTS AND MUSEUM EXHIBITS[1]

47. Two hundred and fifty-one coins received from the Delhi Police were chemically treated for the removal of encrustation.

48. Twenty-one flags received from the Indian Military Academy, Dehra Dun, were cleaned, strengthened and preserved after carrying out deacidification with ammonia vapours.

49. Nineteen objects mainly of copper from the excavated site at Bhagawanpur, seventy-one variously from Dadhri, Nagar, Manda and Samthan, were chemically cleaned and preserved.

[1]Chemical treatment carried out by : 47 to 51 Science Laboratory, Dehra Dun of the Survey ; 52 to 59 Regional Science Laboratory, Hyderabad, of the Survey ; and information on item 56 from Director of Archaeology, Gujarat.

50. Four *farmans* of the time of Shahjahan were deacidified with the help of Ammonia vapours and some spots bleached with hydrogen peroxide. The cleaned *farmans* were encased in cellulose sheets.

51. Three miniature Kangra paintings on paper belonging to the Indian Military Academy, Dehra Dun, were treated for deacidification and bleaching of stains.

52. An embroidered silk coat of Tipu Sultan, which was in a highly damaged condition was repaired and cleaned for the Tipu Sultan Museum, Srirangapatna, in Karnataka.

53. A paper painting mounted on cloth, of the Archaeological Museum, Hampi, was repaired, cleaned and preserved.

54. One hundred and eighty-eight iron objects, one hundred and seventy-two copper objects, one hundred and four copper coins and eighty-two silver coins received from the Excavations Branch, Nagpur and Southern Circle, Madras, of the Survey were chemically cleaned and preserved.

55. The work of stripping of the Nayaka layer of painting above the Chola layer in the Brihadisvara temple, Thanjavur was continued.

56. A bronze image of Tirthankara found at Mahudi, District Banas Kantha and seven copper coins, out of a hoard discovered at Kasor, District Kheda, were treated chemically.

RESEARCH AND ANALYSIS[1]

57. Consequent upon the decision of the Government of India to set up an Oil Refinery at Mathura with a capacity of six million tonnes per annum (foundation stone being laid on 2 October 1973), the Archaeological Survey of India had become apprehensive about the the possible adverse effects of the gaseous effluents from the stacks of the proposed Refinery on the monuments in Agra, particularly the Taj. The site selected for the location of the proposed Refinery is on the windward direction of the Taj. Accordingly, the National Environmental Engineering Research Institute (NEERI), Nagpur, had been addressed in July 1973 to carry out a survey of the present air quality around the monuments in Agra. According to the interim reports submitted by NEERI, conducted during December 1975 to January 1976, the present daily average level of sulphur dioxide was calculated to be on the higher side, as ranging from 12 to as high as 409 micrograms/m,^{3} the average being 107 micrograms/m.^{3} The results of investigation also indicated that there is substantial amount of pollution both sulphur dioxides and particulate matter in the Agra region, particularly near the Agra Fort and the Taj Mahal (see cover), the possible sources of this pollution being:

a) two power plants, one near the Agra Fort and the other at Itmad-ud-Daula with a total capacity of 29 MW. The power plant at Agra Fort has been in operation for the last fifty years and is considered to be of very old and uneconomic design. Approximately, 1100 tonnes of coal is being used by these power plants daily;

[1]Information from Director (Science) of the Survey except item no. f.8 which is furnished by Dr R V. Joshi of the Deccan College Post-graduate and Research Institute, Pane

(b) industries, including about 250 foundries, around Agra. Most of these industries are situated on the north-east of the monuments with the result that the carry-over of pollutants from them is normally in the direction of the monuments. These foundries are using mostly coal of the order of 2000 to 3000 tonnes daily;

(c) railway shunting yard, situated very close to the Agra Fort, using approximately 40 to 50 tonnes of coal every day for its shunting engines.

With a view to advising the Government on the environmental impact of the Mathura Oil Refinery, the Ministry of Petroleum and Chemicals had set up an Expert Committee in July 1974 with Dr S. Varadarajan, Chairman, IPCL, as Chairman and representatives of the Ministry of Petroleum and Chemicals, Indian Meteorological Department, Environmental Planning and Coordination Department of Science and Technology, National Environmental Engineering Research Institute, Indian Institute of Petroleum, Indian Oil Corporation and Government of Uttar Pradesh, as members. A representative of the Archaeological Survey of India was invited to participate in the Expert Committee from December 1975 onwards. The terms of reference of this Committee were primarily to advice the project authorities on the measures to be taken for keeping the pollution effect to the absolute minimum.

The Expert Committee discussed the requirements and distributed the job of collection of data required by M/S Tecneco to various Indian scientific organizations, including NEERI and the Indian Meteorological Department. The scientists of M/S Tecneco undertook studies at Agra by installing equipment at Taj Mahal and Sikandra and collected stone samples used on monuments as also pieces from quarries, etc. The Tecneco submitted its report in November 1970. The Expert Committee held eleven meetings since its formation in July 1974, the last meeting being held in December 1977. Based on the data made available by Tecneco as well as of the results of studies undertaken by the Meteorological Department, the Expert Committee made the following observations:

a) There is substantial level of pollution of sulphur dioxide and particulate matter in the Agra region. The possible sources are all coal users, consisting of two Power Plants, a number of small industries mainly foundries and a railway shunting yard. They felt that even though the total amount of emission of sulphur dioxide from these sources may be small, their contribution to the air quality of the zone would be considerably high.

(b) The IOC have estimated that the total amount of sulphur dioxide would be limited to one tonne per hour.

(c) Based on dispersal studies made by IMD and the investigations conducted by Tecneco and NEERI, it had been estimated that the contribution from the Refinery to the long term concentration of sulphur dioxide at Agra would be of the order of one to two microgram per cubic metre compared to the existing level of 15 to 20 micrograms per cubic metre. Short term (one hour) peak concentration of the order of 65 micrograms per cubic metre could be expected under worst meteorological conditions in winter.

(d) Effective steps need to be taken quickly to reduce the existing level of pollution in Agra.

(e) It will be necessary to ensure that the actual long term contribution to the sulphur dioxide level at Agra as a result of the Refinery is not more than 2 microgram per cubic metre.

Although primarily the Committee has been formed to advise the project authorities on the measures to be taken for keeping the pollution effect to the absolute minimum, conscious of the great responsibility entrusted to the Committee and its deep concern for the preservation of the priceless monuments at Agra and particularly the Taj Mahal, the Committee considers it of utmost importance that the following recommendations be considered by the Government

for urgent and expeditious implementation in order to reduce substantially the existing pollution levels at Agra and to forestall creation of any future sources of pollution.

(a) Efforts should be made immediately to minimize the existing pollution from sources close to the monuments in the Agra zone. The U.P. State Electricity Board has given indications that the old thermal power station (nominal 10 MW capacity) near the Agra Fort would be dismantled as soon as the grid for power supply to Agra is ready and the other power station (19 MW capacity) at Itmad-ud-Daula which is in good condition will be shut down and used only as a stand-by in emergencies. Closing down of these two power plants is expected to make a significant reduction in the existing levels of sulphur dioxide and particulate matter at Agra. It recommended that early steps are taken to close down these two power plants.

(b) Railways may be advised to replace the present coal-based locomotives with diesel-based locomotives at the marshalling yard at Agra. Since the marshalling yard is very close to the Agra Fort, this measure is expected to reduce the sulphur dioxide and particulate matter levels significantly.

(c) Steps may be taken to ensure that no new industry including small industries or other units which can cause pollution are located north-west of the Taj Mahal.

(d) Efforts may be made to relocate the existing small industries, particularly the foundries, in an area south-east of Agra beyond the Taj Mahal so that emmissions from these industries will not be in the direction of the monuments.

(e) Similar considerations may apply to large industries such as Fertilizer and Petro chemicals. Such industries which are likely to cause environmental pollution may not be located in the neighbourhood of the Refinery. The Committee further recommends that no large industry in the Agra region and its neighbourhood be established without conducting appropriate detailed studies to assess the environ mental effect of such industries on the monuments. Location should be so chosen as to exclude any increase in environmental pollution in the area.

(f) The Committee wishes to record its deep concern regarding the existing level of pollution in Agra. It recommends that an appropriate authority be created which could monitor emissions by industries as well as the air quality at Agra on a continuous basis. This authority should be vested with powers to direct industries causing pollution to limit the level of emission and specify such measures as are necessary to reduce the emission whenever the pollutant level at the monuments exceeds acceptable limits. The Committee particularly desires that the recommendations made in regard to reduction of existing pollution levels at Agra should be converted to a time-bound programme and should be implemented with utmost speed.

(g) The Committee recognizes that there is urgent need for continuous study and investigations to ensure that the monuments at Agra are not exposed to further threats from the pollutants or from any cause. Therefore, it recommends that such studies should be periodically conducted with a view to determine whether any deterioration has occurred and if so, scientifically analyse the cause for the same to enable taking suitable measures for prevention of such deterioration. Since the Archaeological Survey of India are in charge of preservation of the monuments, it is logical that they should be entrusted with the responsibility for getting such continuous studies made. For this purpose, Archaeological Survey of India may have adequately-staffed cell which can carry out studies and additionally utilize the services of other organizations such as National Environmental Engineering Research Institute, Indian Meteorological Department, National Physical Laboratory, Bhaba Atomic Research Centre, National Aeronautical Laboratory, etc., for determining

the status of the monuments and also the effects of pollutants thereon. Adequate funds should be made available to Archaeological Survey of India for these investigations.

(h) The Committee also recommends that studies should be undertaken by competent agencies to explore the possibility of protecting the monuments by measures such as provision of a green belt around Agra in the region between Mathura and Agra.

(i) Even though assurances have been obtained from IOC that adequate precautions would be taken to contain the pollution on account of using coal in the power plant, the Committee is of the opinion that till such time this problem is studied in depth and suitable technologies have been found to be satisfactorily in use elsewhere, the use of coal in the Refinery power plant should be deferred.

(j) In order to ensure that the emissions from the Refinery and their dispersion towards Agra are in accordance with estimates made and assurances given, a minimum of 3 monitoring stations beyond 10 km from the Refinery in the direction of Agra at suitable intervals may be established. These should be operated well before the commissioning of the Refinery and operated continuously thereafter. The agency proposed earlier under para (g) above shall audit these measurements.

(k) The Committee recommends that the Government should establish facilities and expertise in organizations such as Indian Meteorological Department, National Environmental Engineering Research Institute, Bhaba Atomic Research Centre, Environmental Division of Department of Science and Technology, National Aeronautical Laboratory, Physical Research Laboratory and Raman Research Institute for developing dispersion models suitable for conditions as are actually obtainable in different parts of the country. This is essential for studies as the one entrusted to this Committee.

A full-fledged Laboratory for measuring Air Pollution is being set up at Agra to assess the extent of air pollution in the vicinity of the Taj and other monuments at Agra. With the commissioning of the Mathura refinery there is a possibility that the discharge of pollutant gases along with particulate matter may further affect the life and lustre of the marble stone. The need for a comprehensive study of 'air quality' monitoring was therefore strongly felt.

To protect the marble against the deleterious effects of the pollutants various preservatives are being experimented. To consolidate the friable stone and other materials, impregnation of these, objects in polymer solution was carried out. But results were found to be only of limited success. For further study, steps were taken to improve upon the impregnation technique and it was therefore planned to impregnate an object with monomer and then polymerize therein. The study would include polymerization by (i) catalyst/thermal method, and (ii) irradication method.

58. Experiments on the use of Epoxy resin for sealing the cracks in the Jagannatha temple, Puri, were found to be quite satisfactory to prevent any penetration of water. It appears that Epoxy resin is not susceptible to moisture and this characteristic is being further investigated. Significantly, as it does not shrink, the physical damage is minimized.

59. Monuments in marine areas, as is well-known, are prone to salt attack. The crystallization of these salts in dry atmosphere results in flaking off the surface of stone, thereby causing deterioration. Accordingly, the study was carried out with Flame Photometer for the determination of salt contents of different rock-samples to estimate their extent of penetration in the stone;

the experiment may give clues as how best the penetrated salt could be extracted keeping in view the depth of affected areas.

60. The petrographic analyses of some of the stone-samples indicate change in their mineralogical composition which could be attributed to environmental effect. This change has been found to be responsible for several cases of deterioration in stone.

61. To identify pigments, building materials (plaster) used in paintings and sculptures of various monuments, their cross-sections were prepared and studied under microscope and Penfort. These sections were of substantive use in understanding the causes of deterioration and formation of the accretion. The understanding of the nature and form of accretion was quite helpful in guiding the selection of solvent for their removal.

62. Fifty-two potsherds from Harappa to Muslim period were collected and thin section of some of them were prepared; these were studied under the microscope for their mineralogical and firing-condition studies.

63. The bone and soil specimens from Kalibangan and Piprahwa were put to fluorine analysis for chronological determination.

64. Chemical analysis of ancient building material from Bhitargaon, Chittaurgarh, Khajuraho and Lucknow was continued.

65. An attempt was made to evaluate the relative age of pottery samples by carrying out study for their reflectance and gloss with the help of Gloss/Reflectance meter.

66. Experiments on temperature and humidity variation were carried out in the rock-cut caves of Ajanta and Bagh. As the presence of moisture inside the caves at Ajanta is found harmful the daily temperature and humidity variations were recorded inside and outside the caves. Determination of hygroscopic moisture in the rock and plaster surfaces was also carried out regularly. Similarly, to study the effect of temperature and humidity variation on paintings, the daily recording of temperature and humidity in Cave 4 at Bagh was continued. Beside, the plaster samples were analysed for moisture determination.

67. Under the UGC Project, 'Chemical Analysis of Archaeological Sites', Professor R. V. Joshi, Dr G. G. Majumdar, Shri Deotare and Shrimati A. A. Kashirsagar collected samples of habitational deposits from the excavations at Somnath, Daimabad and Pedda Pavuralla. A few of the results of the studies are given in the Table below. They indicate varied human activity at different periods as reflected in the phosphate contents. At Daimabad the phosphate in the cultural deposits is higher more than five times than that present in the non-cultural soil. Greater human activity is seen in the Savalda stage. Similarly, Somnath also shows higher phosphate values during early Prabhas and Early Historic periods. The cave-deposit in Pedda Pavuralla shows clearly increased human activity during the Upper Palaeolithic while it is much less during the Neolithic times.

Culture	*Phosphorus ppm*	*Nitrogen per cent*	*Organic Carbon per cent*	*Calcium per cent*	*Calcium Carbonate per cent*	*Electrical conductivity milliohomes*	*PH*
			SOMNATH (HISTORIC), GUJARAT				
Early Historic	4344	0-046	0-540	4-0	13-0	1-50	8-1
Early Prabhas	5875	0-028	0-695	9-2	26-0	1-00	8-7
Non-cultural deposit	625	0-012	0-399	10-8	30-0	0-50	8-8
			DAIMABAD (PROTOHISTORIC), MAHARASHTRA				
Jorwe	3452	0-044	0-525	4-25	12-0	3-5	7-8
Malwa	3160	0-048	0-735	1-45	5-0	3-0	7-7
Buff & Cream	3368	0-051	0-714	1-38	5-0	5-0	7-9
Late Harappan	3735	0-059	0-861	2-19	7-0	5-5	8-0
Savalda	3783	0-069	1-071	1-10	4-0	4-5	7-9
Non cultural deposit	687	0-025	0-294	0-52	2-5	3-0	7-9
			PEDDA PAVURALLA LIMESTONE CAVE (PREHISTORIC), ANDHRA PRADESH				
Neolithic	1187	0-126	0-945	0-46	2-0	0-65	7-9
Upper Palaeolithic	3625	0-080	0-462		—	0-54	7-6

XII. ARCHAEOLOGICAL GARDENS[1]

ANDHRA PRADESH

1. ARCHAEOLOGICAL MUSEUM, AMARAVATI, DISTRICT GUNTUR.—Attention was paid mainly towards providing irrigational facilities in the form of laying out P.V.C. pipelines and installation of 5 h.p. ejecto pumping set; necessary supply of electricity was also obtained.

2. HILL-TOP, NAGARJUNAKONDA, DISTRICT GUNTUR.—A lawn in the first enclosure is being laid out while the work for laying out a pathway leading to the office of the Garden Branch there has been completed.

3. GOLCONDA FORT, HYDERABAD, DISTRICT HYDERABAD.—The work on the Nagina Bagh was completed and it has now been brought under maintenance stage. Some more areas inside the fort have also been brought under gardening operation. Thus the area in front of the Armoury hall has been taken up for landscaping: all preparatory cultivation was completed except grassing which could not be done due to shortage of water. An irrigation line has been extended here from the adjoining Nagina Bagh. Besides, an approach road has also been provided in this sector. Furthermore, the land in front of Bala-Hissar was turfed and a 5 h.p. electric pumping set installed in the ancient well in front of the Conservation Assistant's Office inside the Fort. Even the work of laying out of pipe lines for effective irrigation was carried out.

BIHAR

4. EXCAVATED REMAINS AND ARCHAEOLOGICAL MUSEUMS, NALANDA, DISTRICT NALANDA.—A suitable pumping set was installed in the newly-bored well and thereafter the main and distributory pipe lines for proper irrigation facilities in the garden have been laid. Lawns which had outlived their life are being returfed. The area between the excavated remains and the Museum was acquired and preparatory cultivation for developing an ornamental garden is in progress.

5. ARCHAEOLOGICAL AREA, KUMRAHAR, DISTRICT PATNA.—The rear sector of the garden here was taken up for reorientation and it was converted into a fine rustic garden.

DELHI

6. HUMAYUN'S TOMB, NEW DELHI.—Some new annual beds and ornamental plants were introduced in the Arab-ki-Sarai area. The supply of water improved considerably after the installation of a 22 h.p. motor. Casualties of roses shrubs, etc., were replaced.

7. HUMAYUN'S TOMB NURSERY, NEW DELHI.—The plant collection was enriched by adding beautiful varieties of roses, ornamental plants and soon.

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[1]'Information from Chief Horticulturist of the Archaeological Survey of India which maintains nearly 90 archaeological gardens. Important works carried out during the period under review are included here.

8. JANTAR-MANTAR, NEW DELHI.—Some lawns were returfed and a few new beds carved out with a view to improving the look of the garden.

9. KOTLA FIRUZ SHAH, NEW DELHI.—The supply of water was improved after the laying out of yet another network of pipe lines.

10. NAJAF KHAN'S TOMB, NEW DELHI.—The layout of the seasonal flower beds was modified to make the garden attractive.

11. PURANA QILA, NEW DELHI.—New varieties of roses, cannas and several other ornamental trees and plants were introduced to add to the beauty of this newly-developed garden.

12. QUTB-MINAR, NEW DELHI.—Several new sites for picnickers were carved out in this garden which despite heavy rush of visitors is being maintained in fine condition throughout the year.

13. SAFDARJUNG'S TOMB, NEW DELHI.—New shrubs and trees were planted as remedial measures against this rain-affected garden.

GOA, DAMAN AND DIU

14. ARCHAEOLOGICAL AREA, VELHA GOA.—Apart from dismantling the old masonry tank, materials for reviving the fountains were procured.

GUJARAT

15. PAWAGARH FORT, CHAMPANER, DISTRICT PANCH MAHALS.—Horticultural operations for laying out a garden are in progress.

JAMMU AND KASHMIR

16. MART AND TEMPLE, MARTAND, DISTRICT ANANTANAG.—The entire area has now been developed into a garden. More ornamental and rose plants were introduced while casualties in the fruit garden were replaced wherever found necessary.

17. TEMPLES AT PATTAN, DISTRICT BARAMULLA,—Horticultural operations for developing a garden here have been taken up.

KARNATAKA

18. ARCHAEOLOGICAL SITES AND MUSEUM, HAMPI, DISTRICT BELLARY.—The work of development of the surroundings of the Vitthala temple has been taken up whereas efforts arc being made to sink a bore-well for the garden around the Museum in order to fight the water scarcity. However, in spite of acute shortage of water the existing garden was maintained in a presentable condition.

19. ALI II ROUZA, BIJAPUR, DISTRICT BIJAPUR.—Addition of expansive lawns made the garden more attractive.

20. GOL-GUMBAD, BIJAPUR, DISTRICT BIJAPUR.—A pipe line for water-connection from the Municipality of Bijapur to the garden was laid with a view to ease the problem of drinking water. Lawns near the entrance gate were returfed. The entire garden was maintained nicely despite the shortage of water.

21. IBRAHIM ROUZA, BIJAPUR, DISTRICT BIJAPUR.—The area in front of the mausoleum was landscaped and efforts are also being made to sink a bore-well to combat water-scarcity.

22. JOD-GUMBAD, BIJAPUR, DISTRICT BIJAPUR.—Casualties in the shrubberies were suitably replaced and the garden kept in tidy condition.

23. HOYSALESVARA TEMPLE, HALEBID, DISTRICT HASSAN.—The maintenance work of the garden had a set-back because of the water-shortage in the Dvara-samudram lake coupled with the fact that the effort of the State Geological Department to drill a bore-well proved futile. A fresh venture to drill a tube-well in the lake-bed is being planned.

24. DARIA DAULAT BAGH, SRIRANGAPATNA, DISTRICT MANDYA.—The mango orchard in the forecourt of the Bagh was duly levelled into different terraces and the surplus earth dumped in low-lying areas around. The propagational activities enriched the stock of the Nursery here.

25. GUMBAZ, SRIRANGAPATNA, DISTRICT MANDYA.—The orchard was improved further by replacing casualties. Moreover, the mound occurring inside the guava plot was levelled and the surplus earth spread in the plot growing sapota. All the peripheral roads were given a soling and levelled properly. The work of sinking a bore-well has been entrusted to the State Geological Department.

26. KESAVA TEMPLE, SOMANATHPUR, DISTRICT MYSORE.—-The water-problem at the site has eased to a great extent as a result of replacement of worn-out pumping set by a new Myers and Wasp deep-well ejecto pump-set.

MADHYA PRADESH

27. ARCHAEOLOGICAL AREA, KHAJURAHO, DISTRICT CHHATARPUR.—The garden was considerably damaged due to the holding of the Khajuraho festival by the Government of Madhya Pradesh. However, efforts are being made to restore its original condition. The work of laying out of pipe lines from the river bed to all the monuments and digging an open well in the river bed are in progress.

MAHARASHTRA

28. BIBI-KA-MAQBARA, AURANGABAD, DISTRICT AURANGABAD.—To augment the existing water-supply, which is decidedly meagre, a pumping set was installed in the well and pipe lines laid in the forecourt.

29. FORT, SHANWARWADA, PUNE, DISTRICT PUNE.—Gardening at the periphery of the Shanwarwada was taken up; consequently, the site was cleared, dug up and levelled, and materials for laying out pipe lines procured. The main garden inside the fort-enclosure was kept neat and tidy.

ORISSA

30. BHASKARESVARA TEMPLE, BHUBANESWAR, DISTRICT PURI.—For this garden a well has been sunk and a pumping set, already procured, is being installed shortly.

31. RAJARANI TEMPLE, BHUBANESWAR, DISTRICT PURI.—Like other archaeological gardens at Bhubaneswar this one is also being maintained nicely. At present digging up of a well for installing 5 h.p. motor has been taken up.

32. SUN TEMPLE, KONARAK, DISTRICT PURI.—The work of laying out a garden is going ahead. For this purpose the arrangement to augment water supply has almost been completed and new pipe lines and hydrants were provided at suitable places.

33. LORD JAGANNATHA TEMPLE, PURI, DISTRICT PURI.—The area around the temple has been taken up for landscaping. The cut flower gardens for *puja*-purposes are being maintained nicely.

RAJASTHAN

34. ANNASAGAR BARADARI, AJMER, DISTRICT AJMER.—By timely attending to all the seasonal operations the garden, attached to this monument, has been kept in a presentable condition. Flower beds of canna and rose continued to be maintained in attractive manner.

35. DIG-PALACE, DEEG, DISTRICT BHARATPUR.—The ornamental garden within the enclosure of the Palace which has a number-of fountains and rose beds are being maintained in fine condition throughout the year. The fruit orchard or *kachha-bag* acquired recently has been taken up for reorientation and replanting.

36. FORT, CHITTAURGARH, DISTRICT CHITTAURGARH.—Besides maintaining the garden attached to Padmani palace in nice condition, measures have been taken to tap water from the river bed in order to have intensive horticultural operation inside the fort. The latter work has been entrusted to the Central Public Works Department.

UTTAR PRADESH

37. ITMAD-UD-DAULA'S TOMB, AGRA, DISTRICT AGRA.—In order to bring out an ideal garden on the Mughal style this small garden has been taken up for reorientation. Since the garden-paths were hidden at the plinth level, steps had been taken to remove soil to a depth of 40 cm on an average to expose them to view. Instead of linear beds as evidenced in English gardens, the Mughal pattern, as can be seen in the designs available in the inlay work of the monument, was copied and translated on the ground. These patterns are to be edged with red sandstone. In the plantation scheme, plants known in the Islamic gardens was adopted. All these apart, the defunct fountains were revived by the flow of sufficient quantity of water from two tube-wells, which were drilled recently. Its forecourt has also been reoriented.

38. AGRA FORT, AGRA, DISTRICT AGRA.—In the inner garden-complex of the Fort, the old lawns in front of the Jahangiri-mahal and Machi-bhavan were returfed. For providing better irrigation facilities a network of pipe-lines was laid out and groups of shrubs were planted in the outer garden of the Fort.

39. KHAN-I-ALAM NURSERY, AGRA, DISTRICT AGRA.—Being the Central Nursery the propagational activities were intensified and several new varieties of plants introduced.

40. RAMBAGH, AGRA, DISTRICT AGRA.—Because of the initiation of suitable steps the maintenance of the garden together with its orchard could be improved.

41. ROMAN CATHOLIC CEMETERY, AGRA, DISTRICT AGRA.—Growing of white and sweet-scented flowers in the garden within the enclosure improved its general appearance consider ably.

42. TAJ-MAHAL, AGRA, DISTRICT AGRA.—Plots infested with weeds were returfed while the shrubbery was improved by replacement of old plants.

43. FATEHPUR SIKRI, DISTRICT AGRA.—As intensive excavations are in progress under a National Project, the pipe lines for irrigational purposes had to be re-aligned.

44. AKBAR'S TOMB, SIKANDRA, DISTRICT AGRA.—-Fresh grass has come up well after the lawns were returfed.

45. MARIUM'S TOMB, SIKANDRA, DISTRICT AGRA.—Two back plots were rejuvinated by returfing as earlier ones had outlived their life.

46. ARCHAEOLOGICAL AREA, KUSHINAGAR, DISTRICT DEORIA.—The work concerning the re-laying of pipe lines and construction of a cabin at the newly-bored tube-well has since been completed. Moreover, the front lawns were dug up for regrassing.

47. ARCHAEOLOGICAL AREA, SAHET AND MAHET (ANCIENT SRAVASTI), DISTRICT GONDA.—Besides maintaining the garden nicely around the ruins at Sahet, a tube-well was bored by the Central Public Works Department on behalf of the Survey to provide irrigational facilities to the proposed garden at Mahet.

48. ARCHAEOLOGICAL SITES, SARNATH, DISTRICT VARANASI.—Returfing of the front lawn of the garden around Chaukhandi was undertaken. Its back sector was to be designed by planting sacred trees mentioned in Buddhist literature. Apart from regrassing the outlived lawns of the garden around the monastic sites, proper fencing was also provided. Seasonal plants were planted in new beds which have recently been carved out. Preliminary work in respect of sinking a bore-well was completed.

XIII. PUBLICATIONS

PUBLICATIONS OF THE SURVEY

1. INDIAN ARCHAEOLOGY—*A* REVIEW.—The issues for 1972-73 and 1973-74 were made press-ready.

2. ARCHITECTURAL SURVEY OF TEMPLES.—The second number of the series *An Architectural Survey of Temples of Kerala,* by H. Sarkar was brought out.

3. EPIGRAPHIA INDICA.—Part VII of volume XXXVIII was sent to press.

4. EPIGRAPHIA INDICA—ARABIC AND PERSIAN SUPPLEMENT.—The number for the year 1971 was brought out.

5. ANNUAL REPORT ON INDIAN EPIGRAPHY.—The issues for 1969-70 and 1970-71 are under print.

6. GUIDE BOOKS.—*Bhubaneswar* (fourth edition) and *Sanchi* (fourth edition), both by Debala Mitra and the *Chola Temples* (third edition) by C. Sivaramamurti were published.

7. PICTURE POSTCARDS.—Sets of black and white picture postcards on Amaravati, Halebid, Nagarjunakonda, Somanathpur, Sringeri and Srirangapatna were printed.

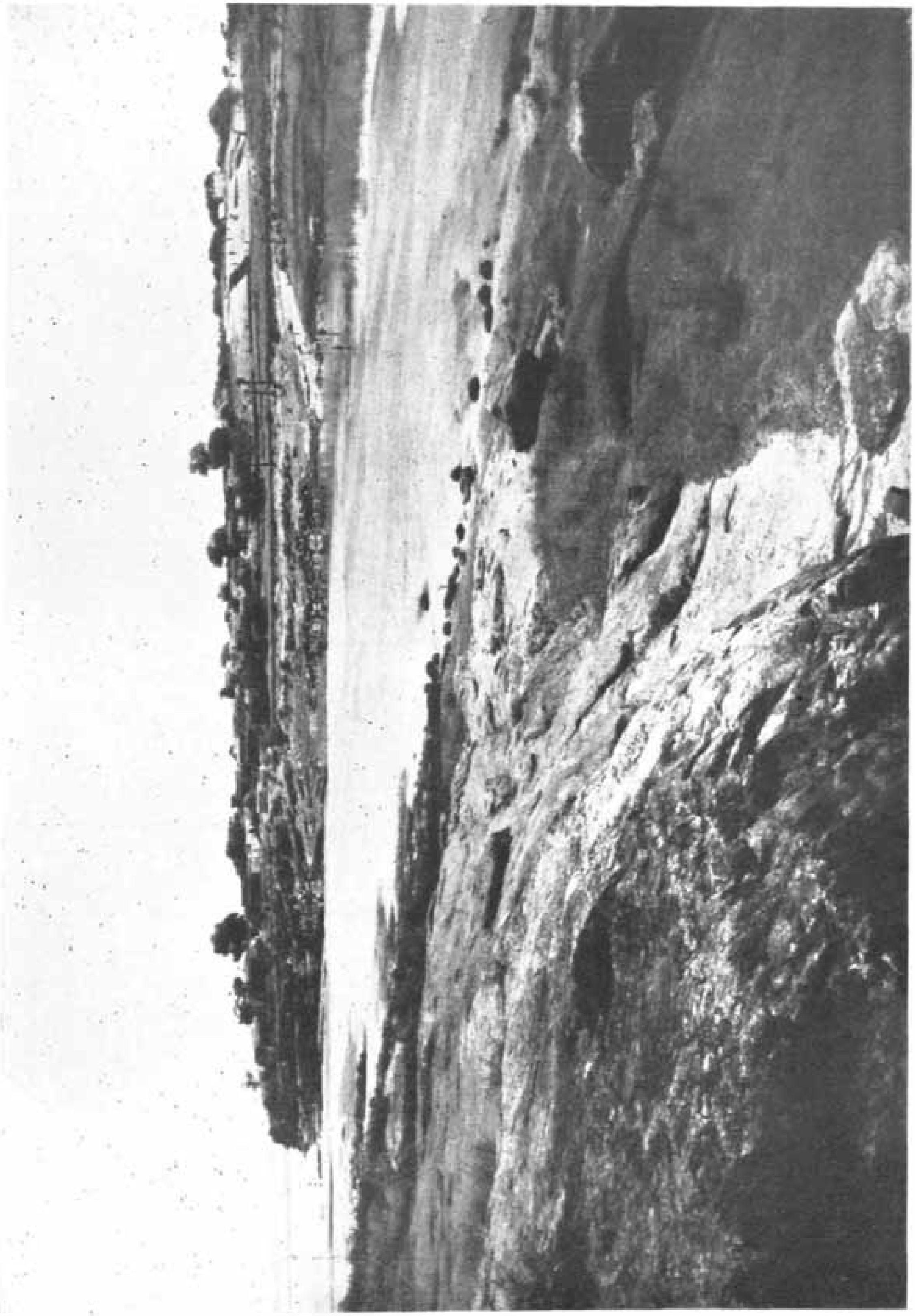
OTHER PUBLICATIONS

ANDHRA PRADESH.—The Department of Archaeology and Museums, Government of Andhra Pradesh, published *Kakatiya Charitra, Temple Sculpture of Andhra Pradesh, Cuddapah District Inscriptions, Lepakshi Portfolios, Pre-historic and Proto-historic Culture of Palvoy* and volume 37 of the *Journal of Andhra Historical Research Society.*

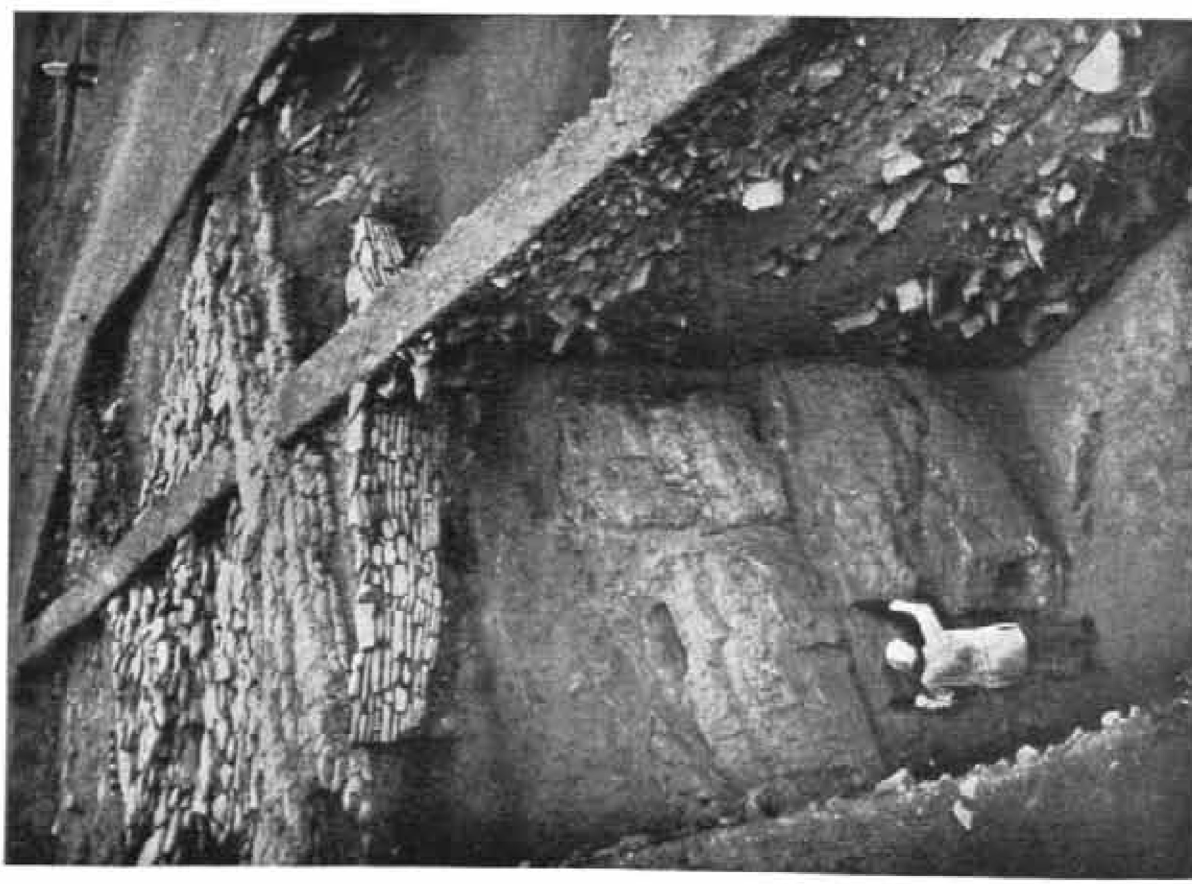
ASSAM.—The Department of Archaeology and State Museum, Government of Assam, Gauhati, published the *Bulletin no.* 3 of the Assam State Museum.

KARNATAKA.—The Directorate of Archaeology and Museums in Karnataka, Mysore, reprinted *A monograph on Kesava Temple at Somanathpur* and *A Guide to Halebid,* besides the publication of the monograph on *Progress of Archaeology in Karnataka.*

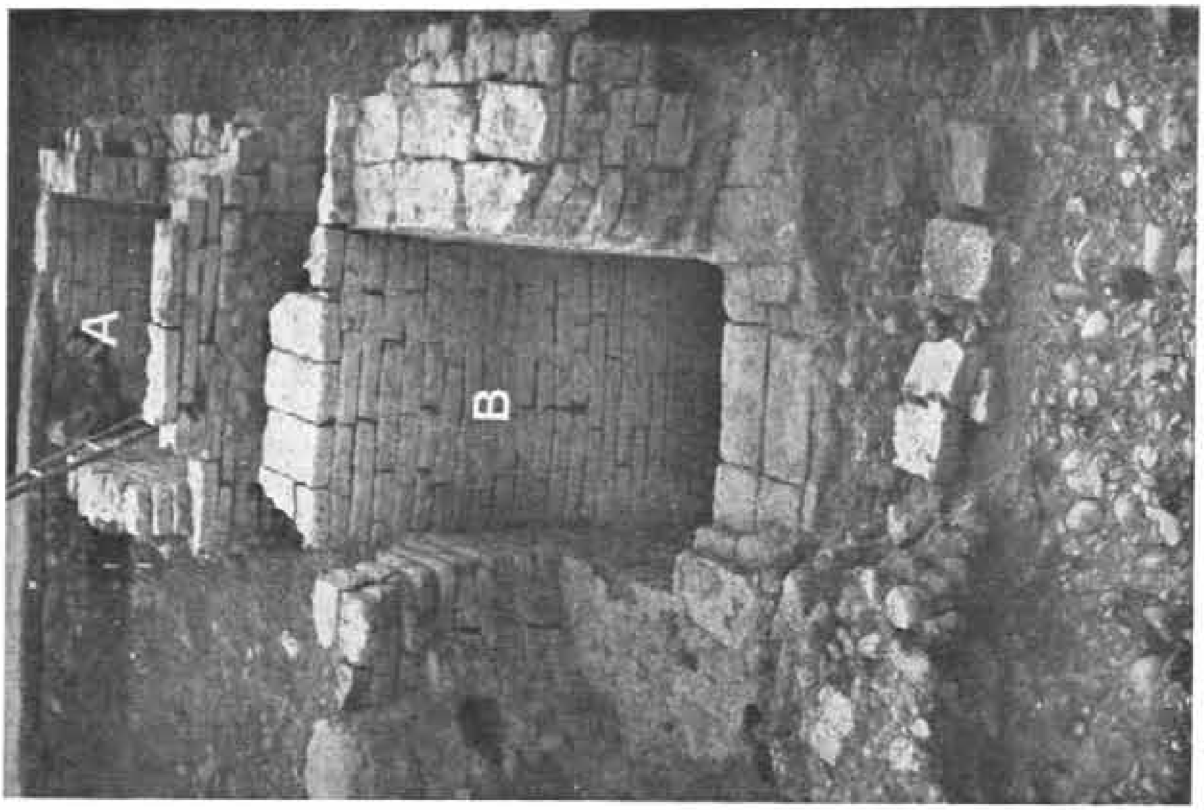
ORISSA.—The Department of Tourism and Cultural Affairs, Government of Orissa, published a report entitled 'Archaeological Report of the Prachi Valley'. The Annual Archaeological Survey Report dealing with exploration, survey, excavation of ancient sites and monuments is in the press.



Satanikota : panoramic view of site and village *See p. 2*



A



B

Satanikota : A, *cutting across rampart*; B, *baked brick structures, Period II, phase II A* *See pp. 5 and 7*



A



B

Satanikota : A, *exposed gateway-complex and moat, Period II, phase I;* B, *general view of megaliths* *See pp. 5 and 11*



A



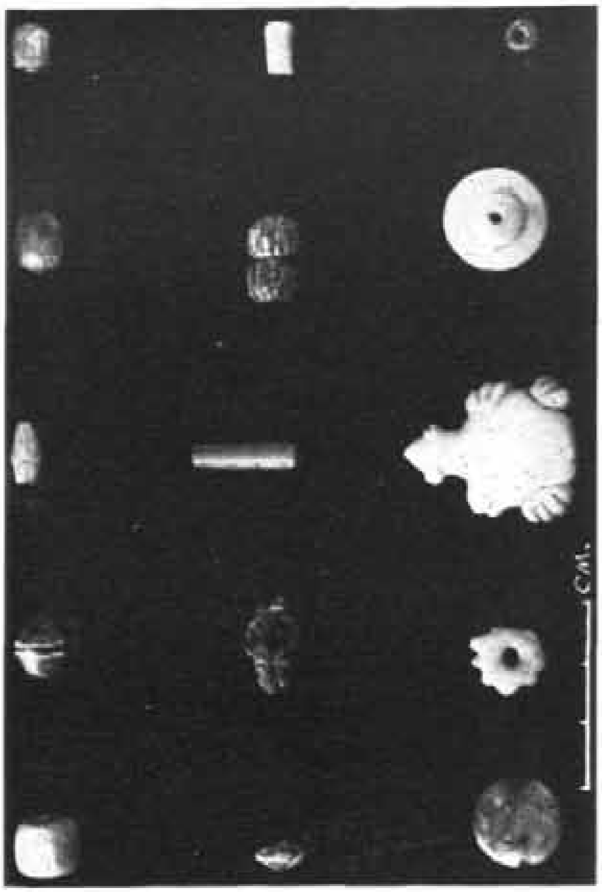
B



C



D

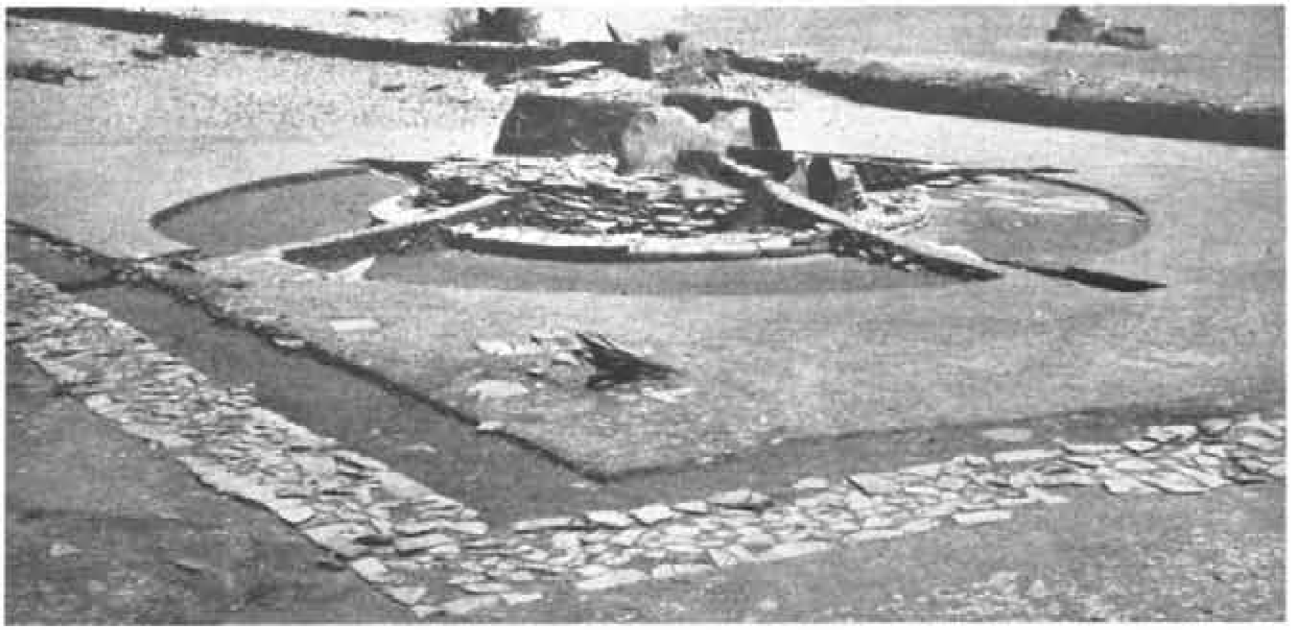


E

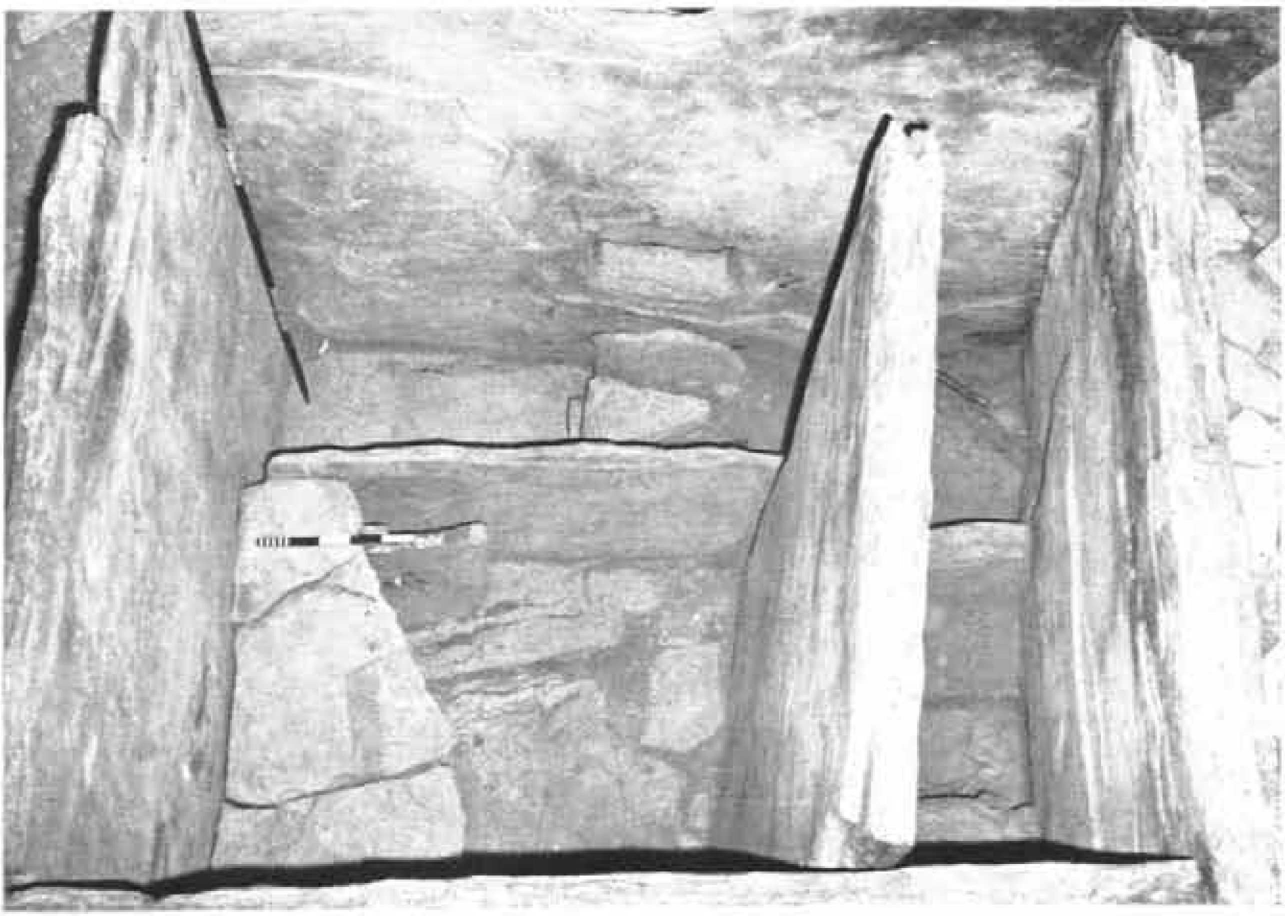


F

Satanikota : A, *flat tile with holes*; B, *Rouletted Ware*; C, *coin of Siri Sata Kumara*; D, *terracotta human head*; E, *other antiquities, Period II*; F, *stone plaques depicting Lakulisa and fragment of a halo* *See pp. 7 and 9*

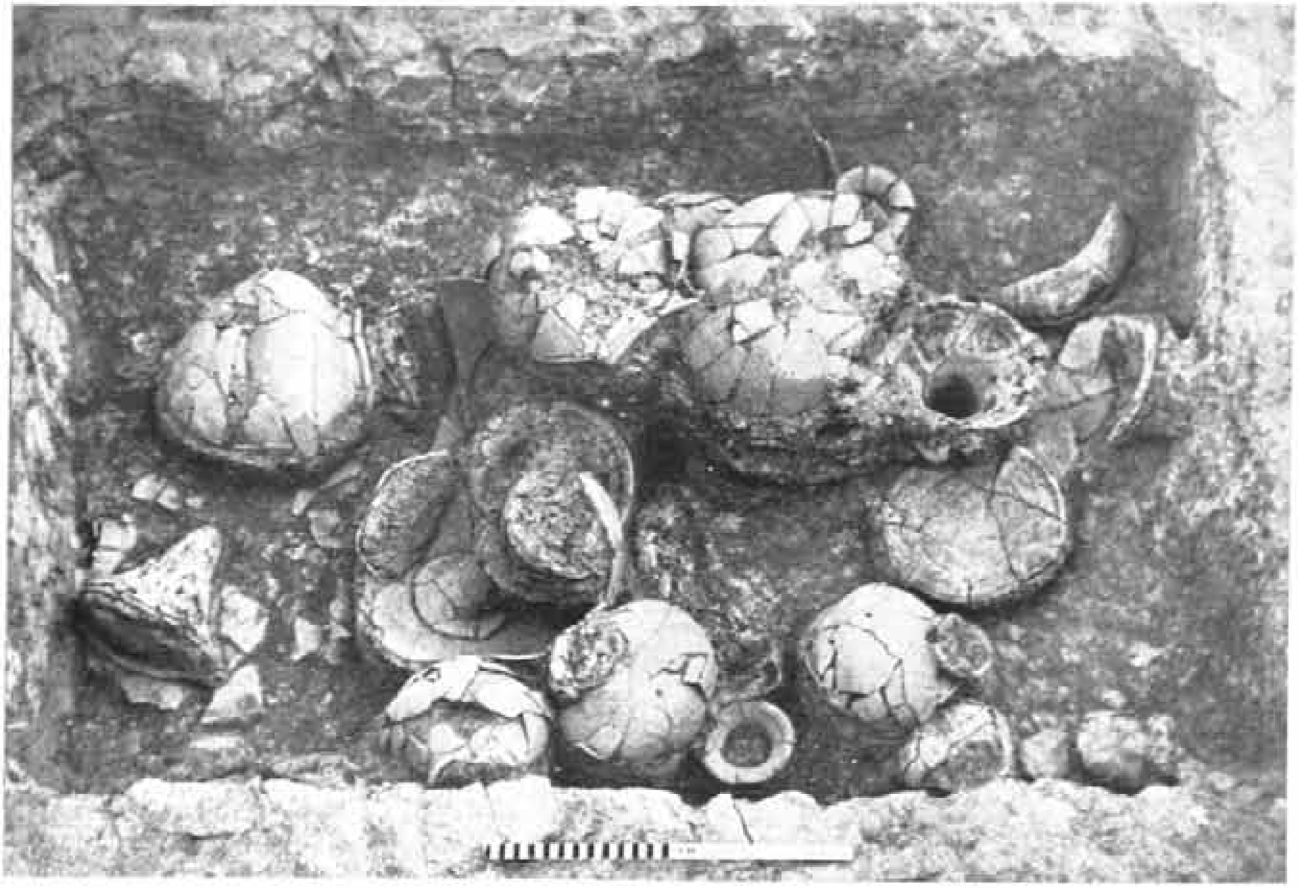


A

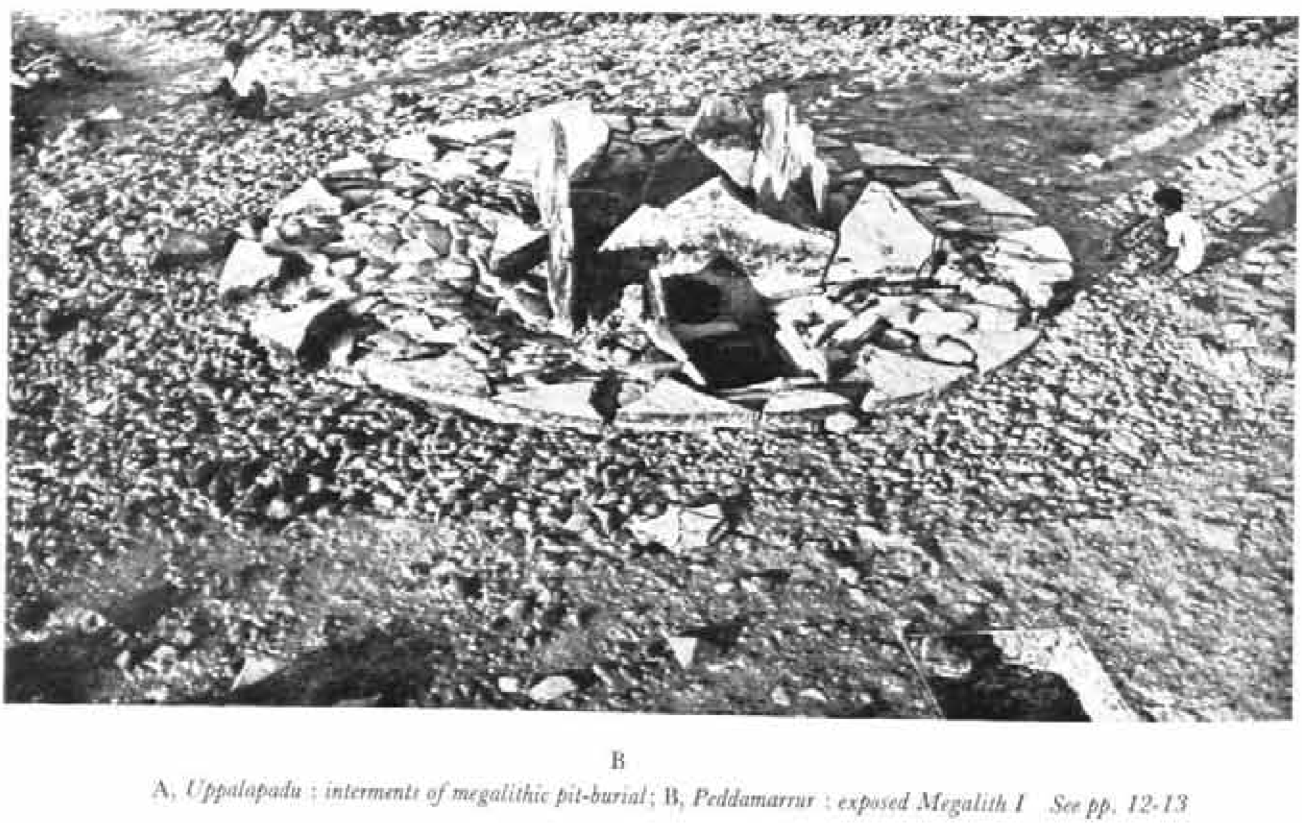


B

Chagatur : A, megalithic cist with passage and enclosure wall; B, exposed cist *See p. 11*



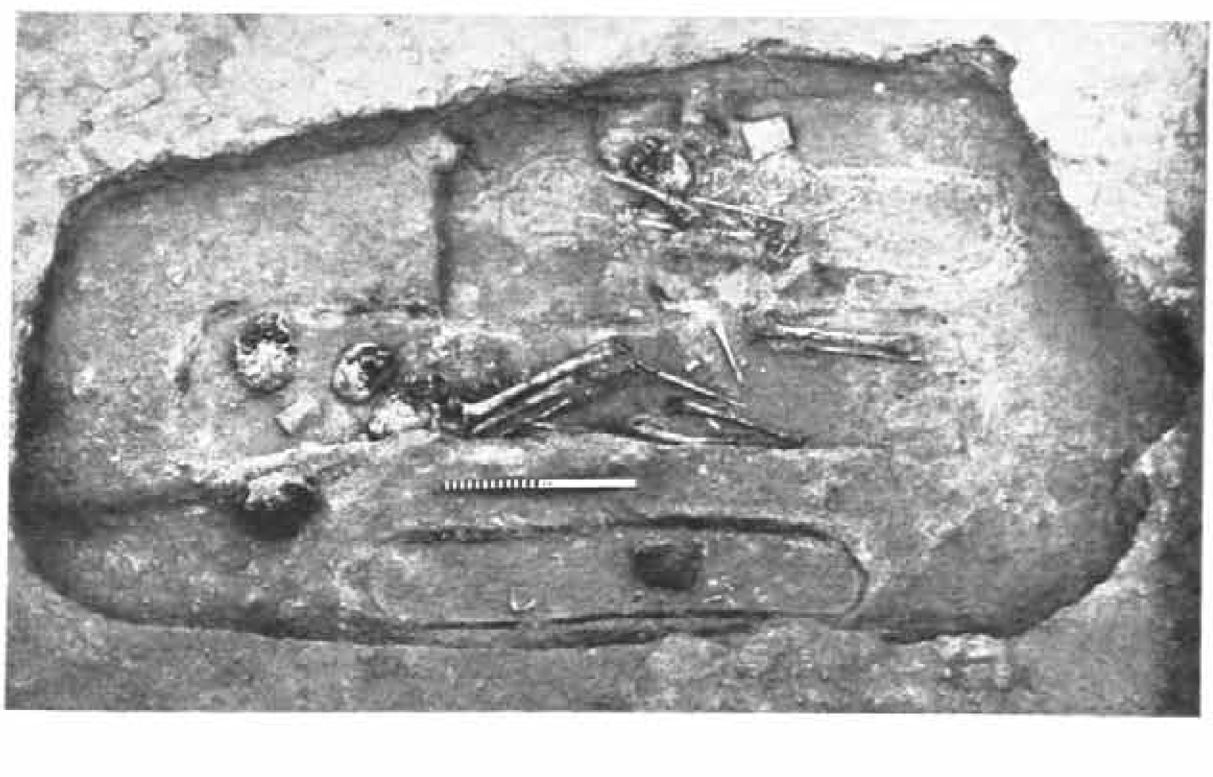
A



B

A, *Uppalapadu* : *interments of megalithic pit-burial*; B, *Peddamarrur* : *exposed Megalith I* See pp. 12-13





A

B

A, *Uppalapadu* : *exposed wooden coffins with interments in a megalith*; B, *Peddamarrur* : *exposed Megalith III* *See pp. 12-13*



B

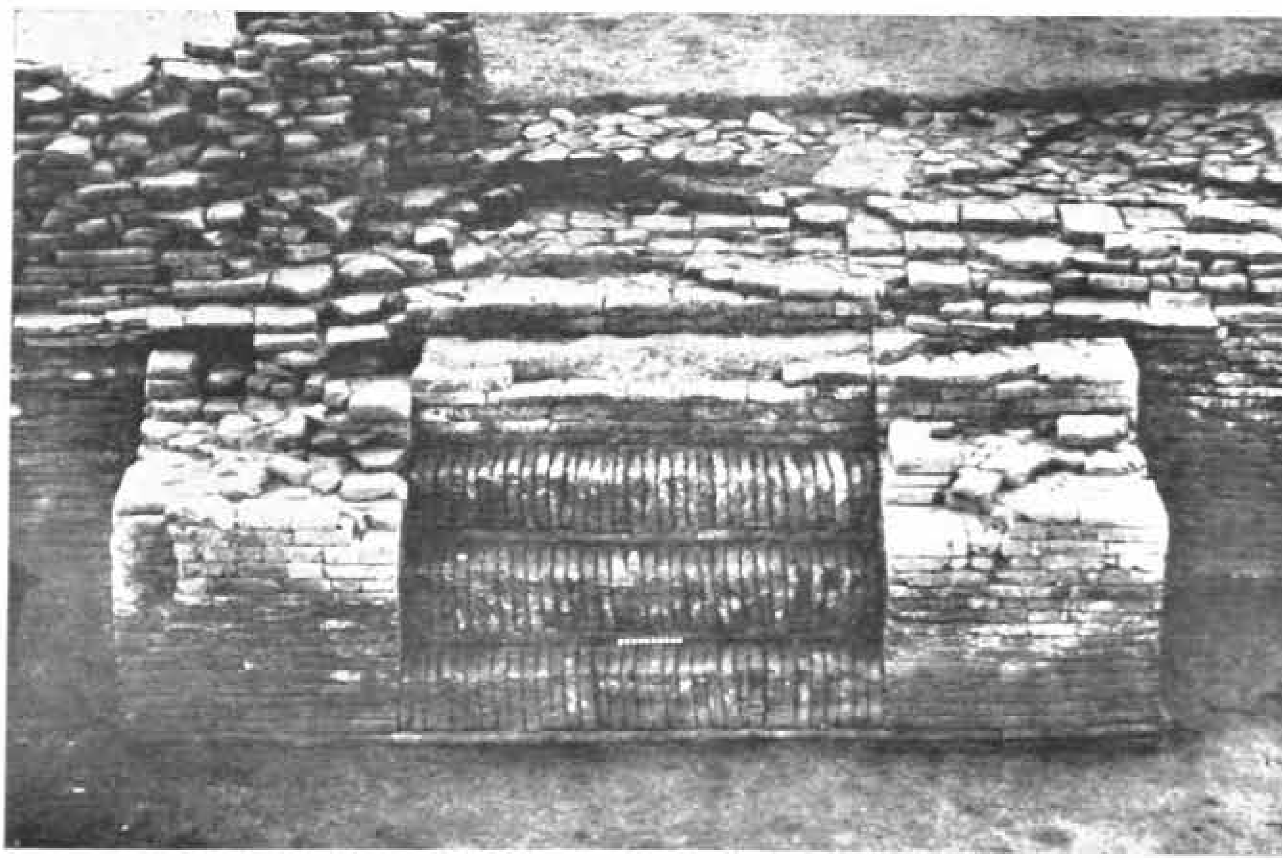


A

A, *Uppalapadu* : *interments of megalithic pit-burial*; B, *Peddamarrur* : *sarcophagi inside Megalith II* *See pp. 12-13*



A



B

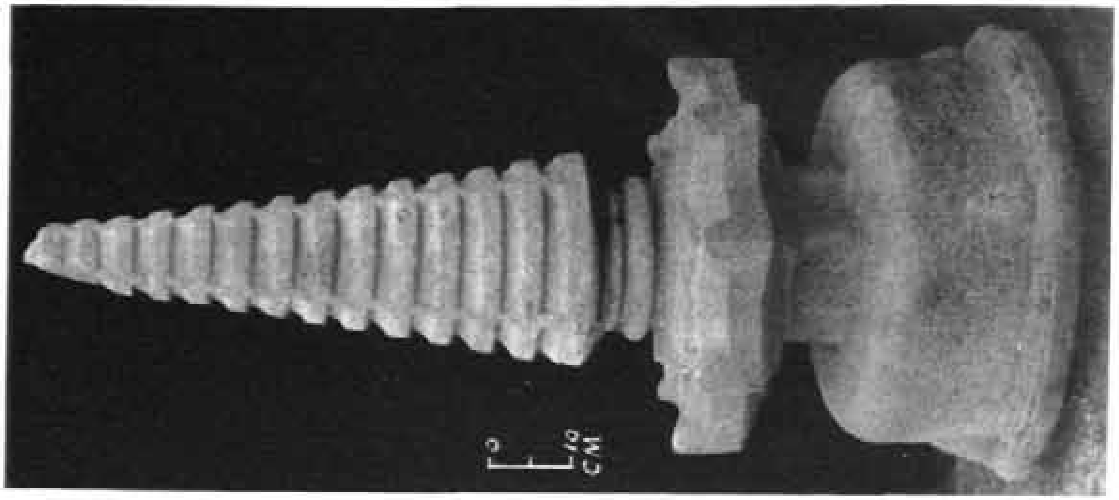
A, *Calingapatnam : partially-exposed stupa*; B, *Antichak : exposed flight of steps* See pp. 14-15



A

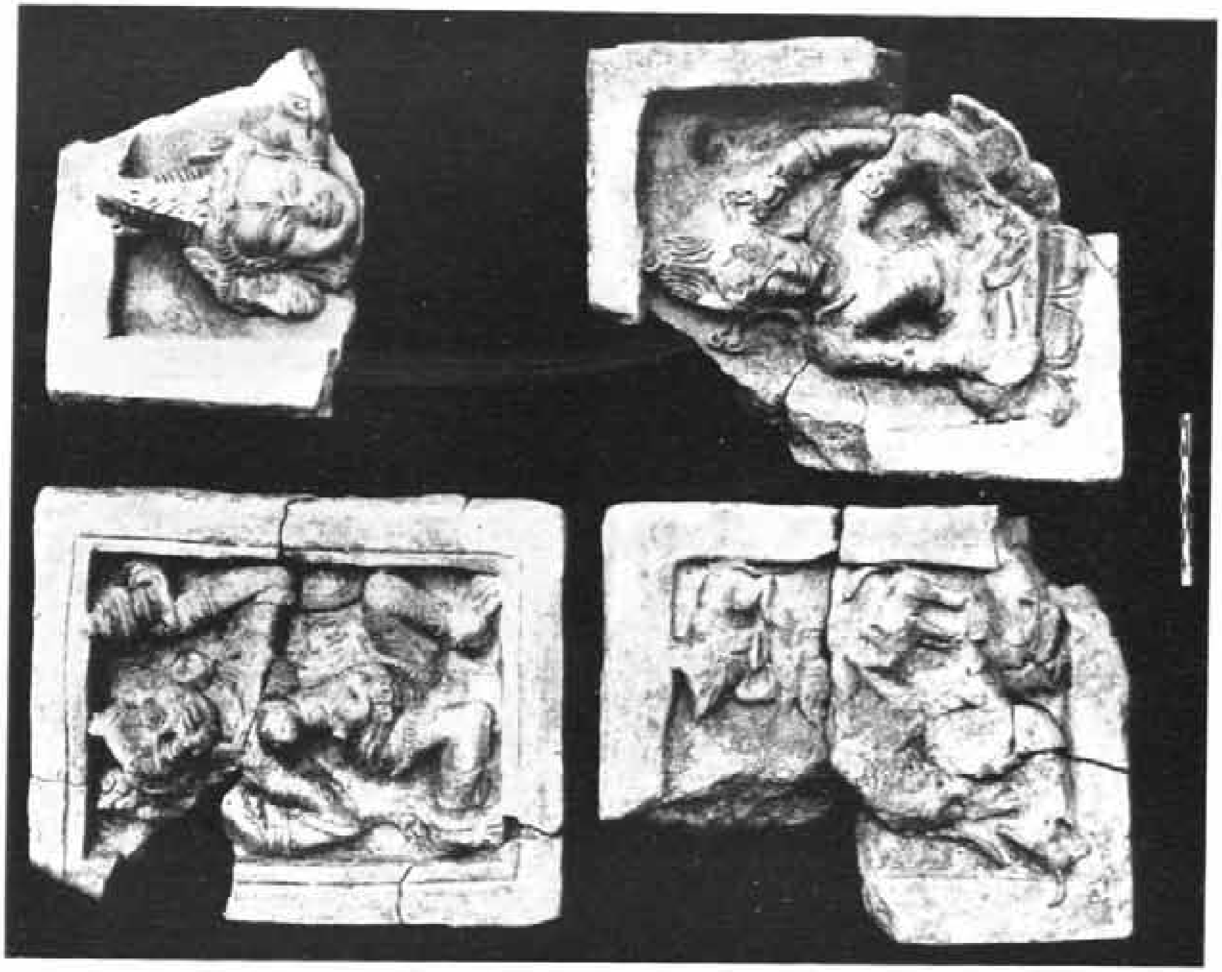


B



C

Antichak : A, *Lokesvara*; B, *Tara*; C, *votive stupa* *See p. 15*



C

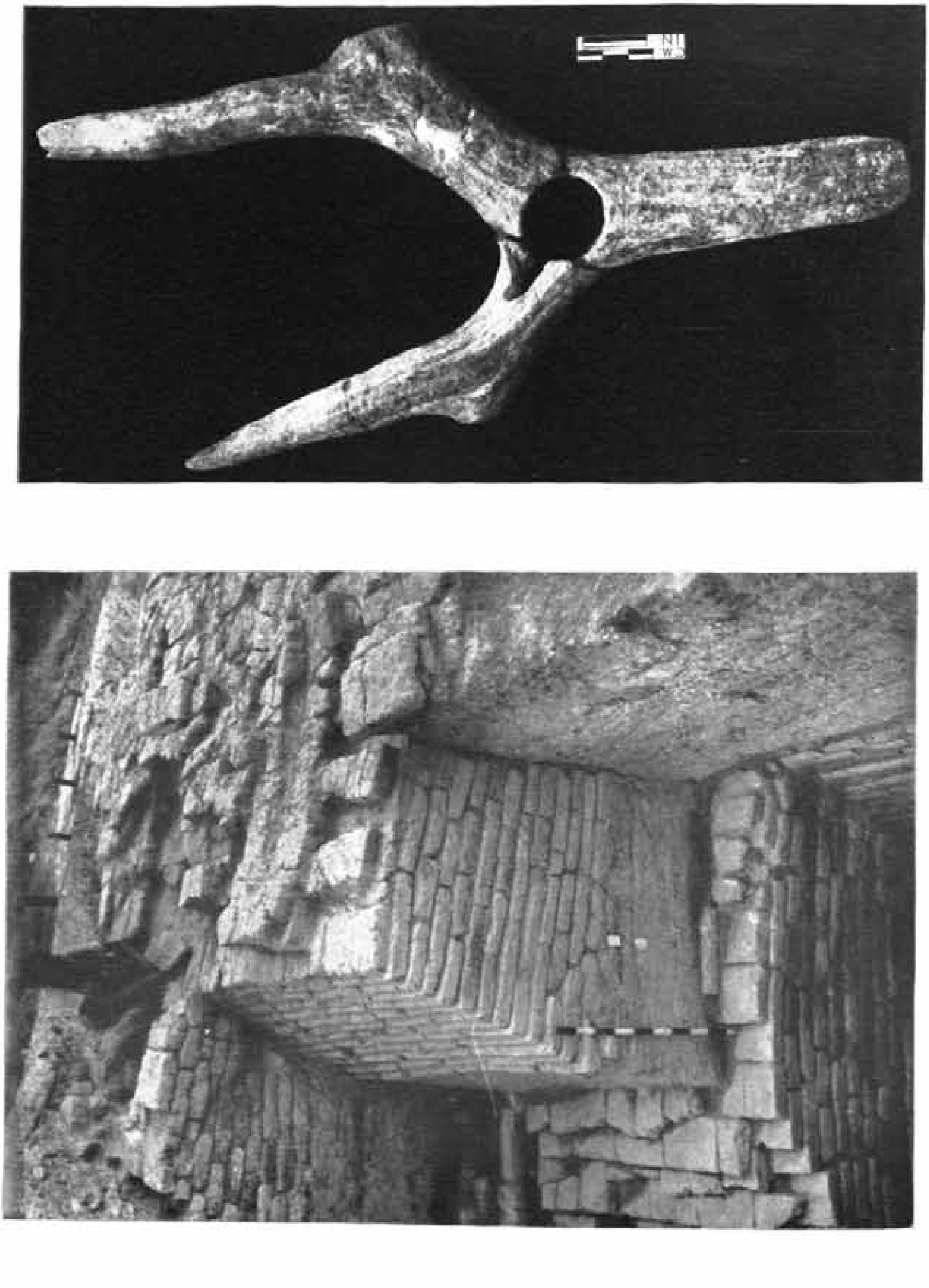


A



B

Antichak : A, *head of Avalokiteśvara*; B, *kirtimukha*; C, *terracotta plaques* *See p. 15*



B

A

A. Kotragarh : exposed south-western watch-tower; B. *Chechar-Kutubpur : double-forked pick-axe on antler, Period I A*

See pp. 15 and 18

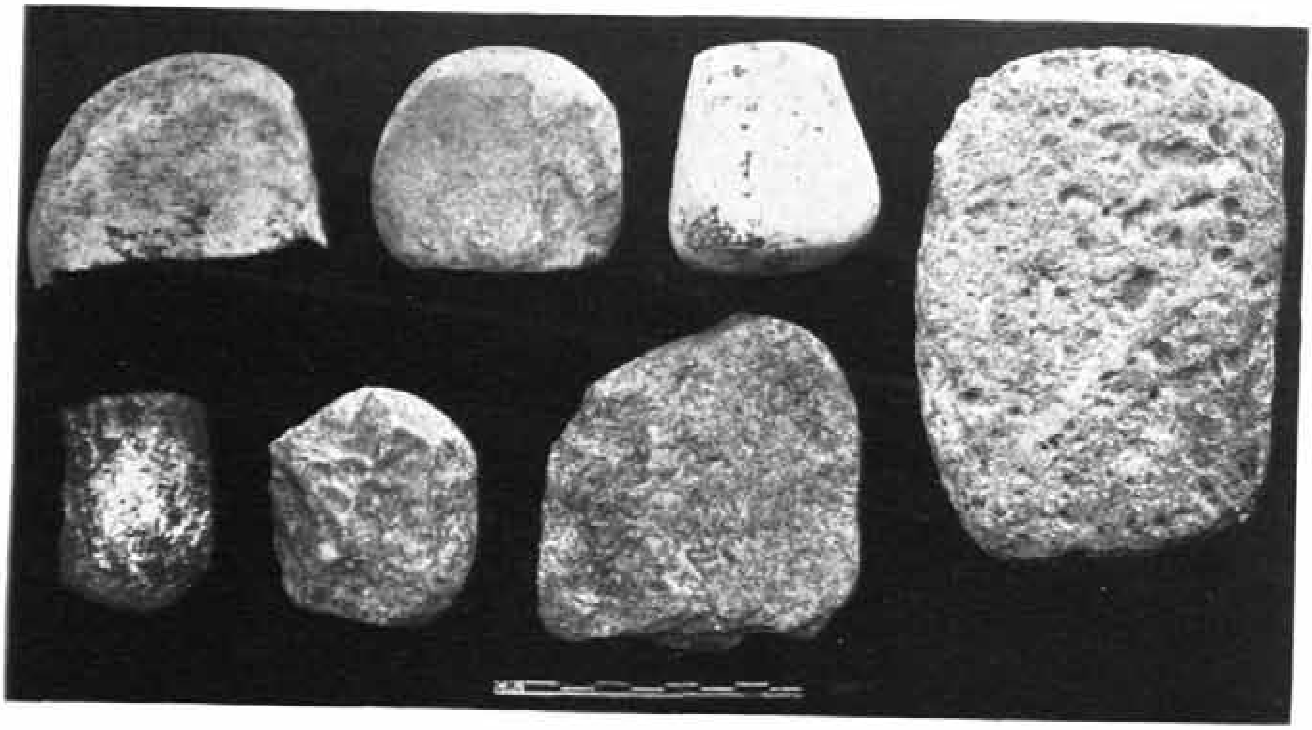


A

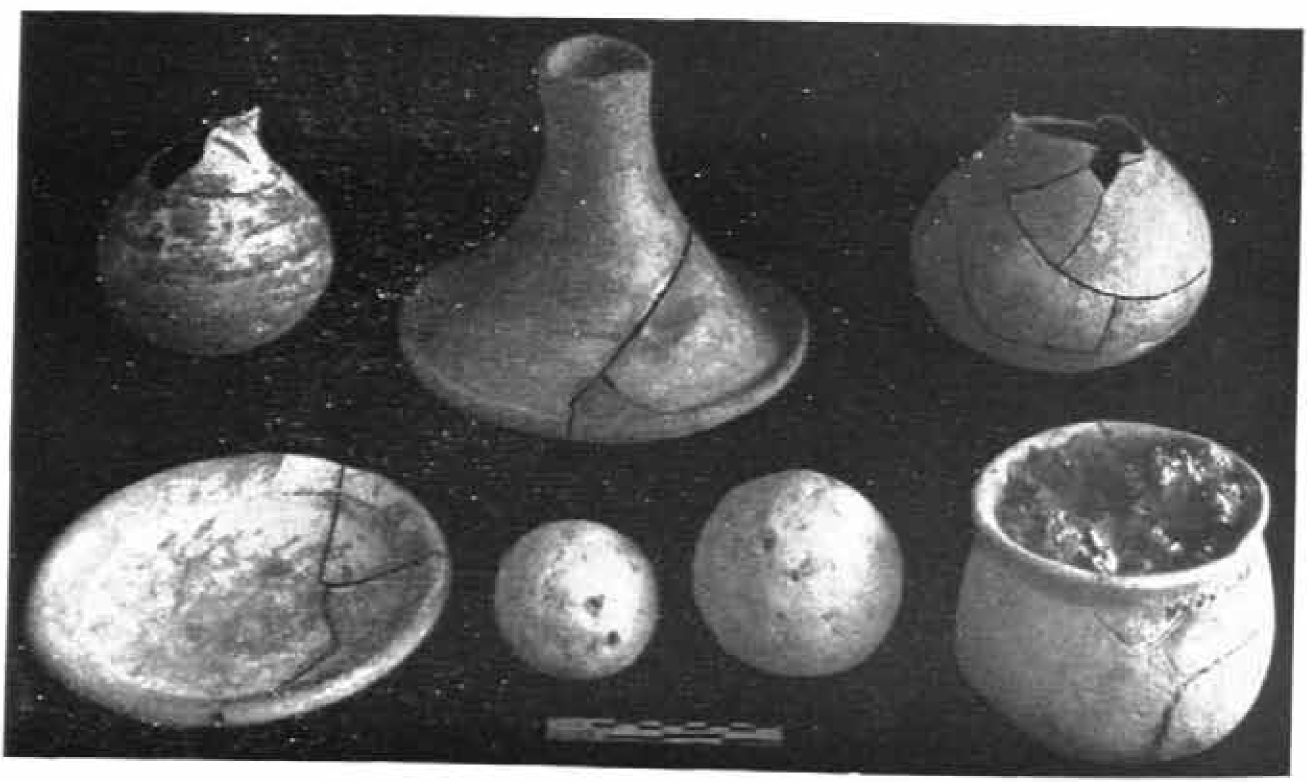


B

A, *Nalanda : painting on back wall of garbhagriha*; B, *Aphsad : general view of exposed structure* *See p. 16*

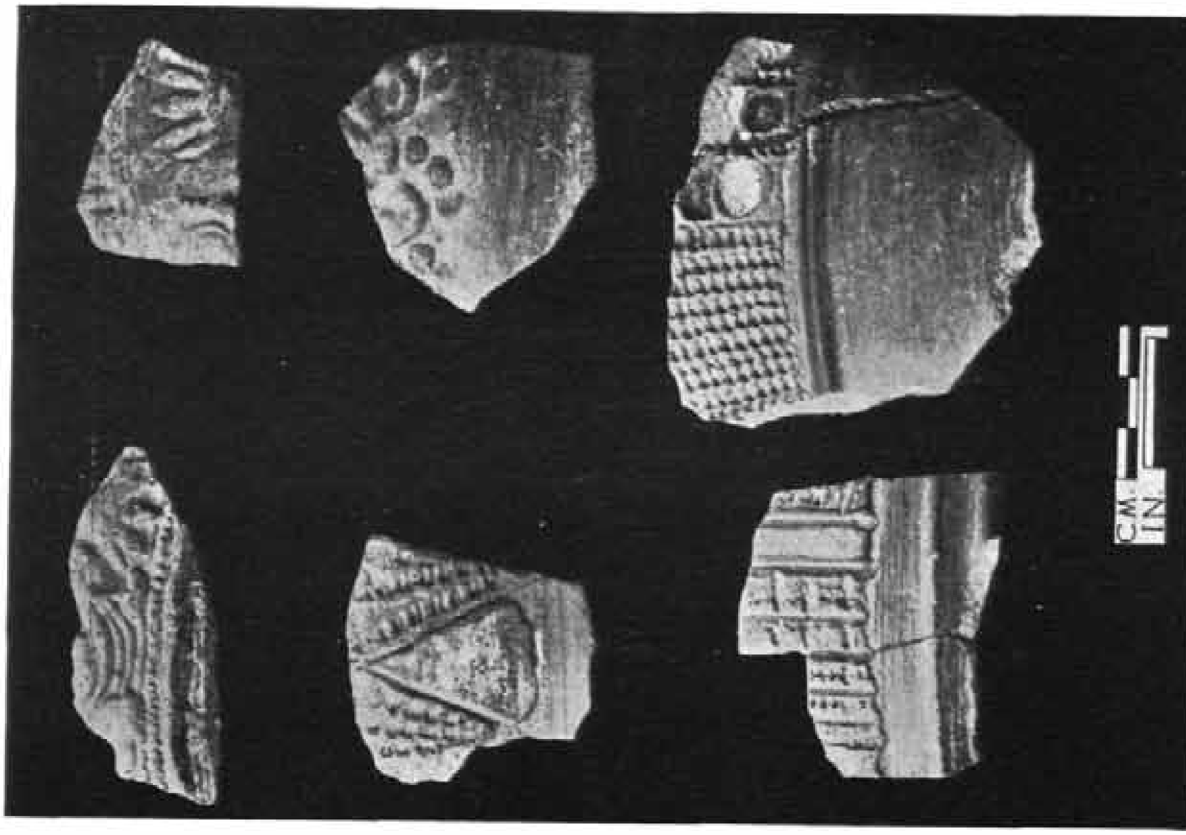


A



B

A, *Chechar-Kutubpur* : *polished stone tools, Period I*; B, *Kanewal* : *objects from exposed huts* See pp. 17 and 21

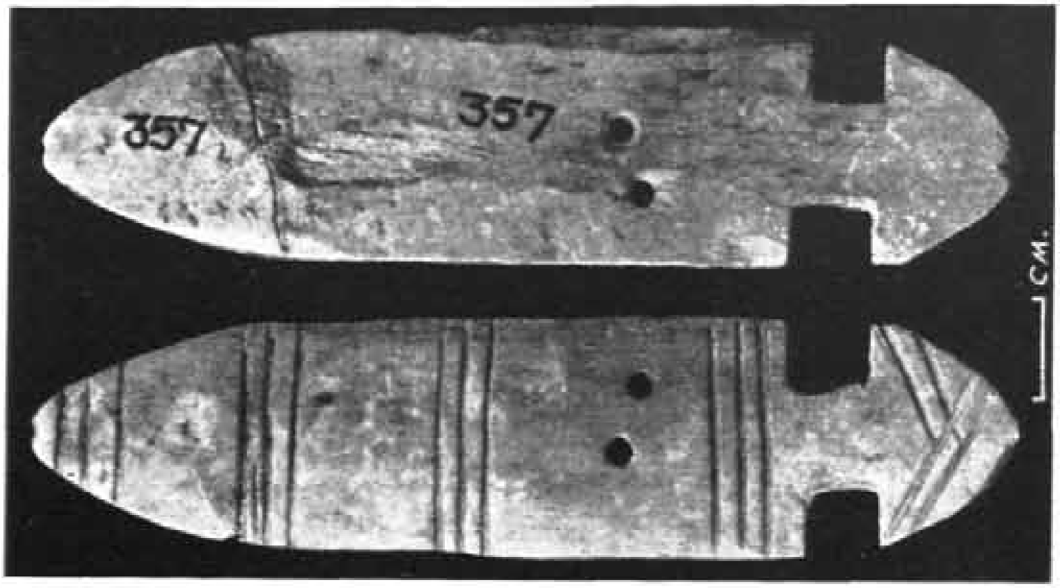


B

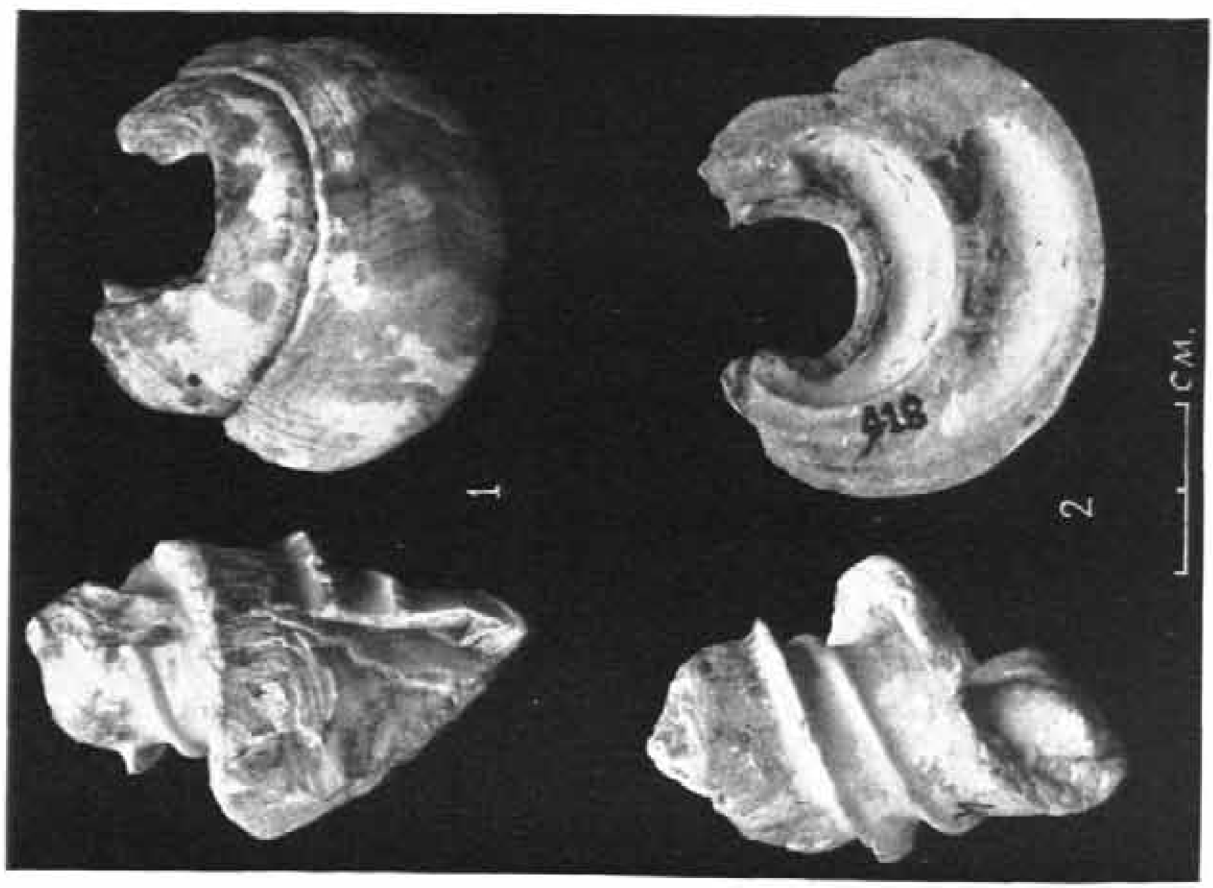


A

Karvan : A, *exposed structure at Sindhvai Mata temple*; B, *decorated pottery, Period II* *See p.* 22



B

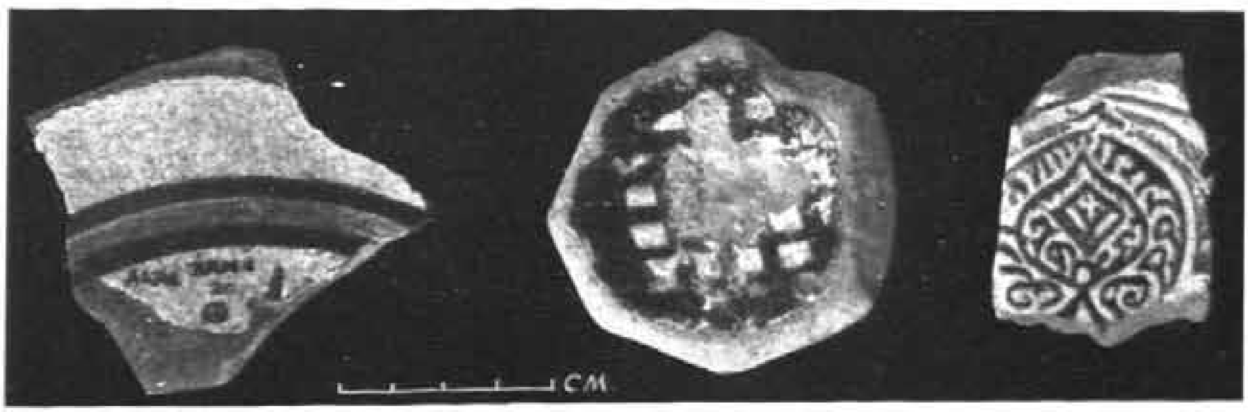


A

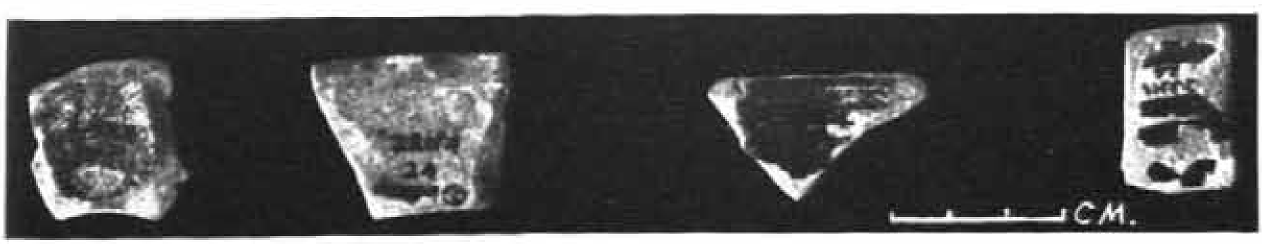
Karvan : A, *cut shell and columella*; B, *dagger-shaped bone pendant, Period I* *See p. 22*



A

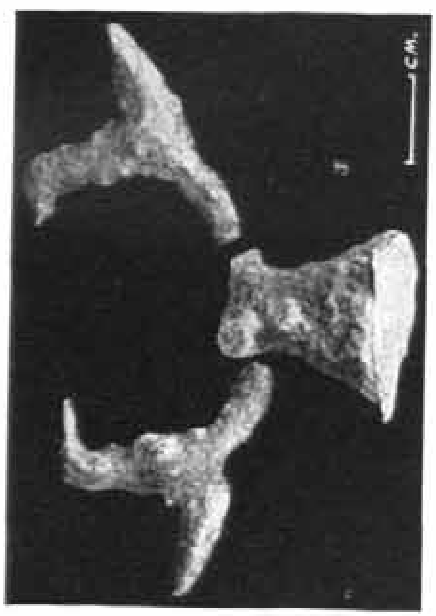


B



C

Karvan : A, *exposed brick kiln*; B-C, *glazed ware, Period II* *See p. 22*



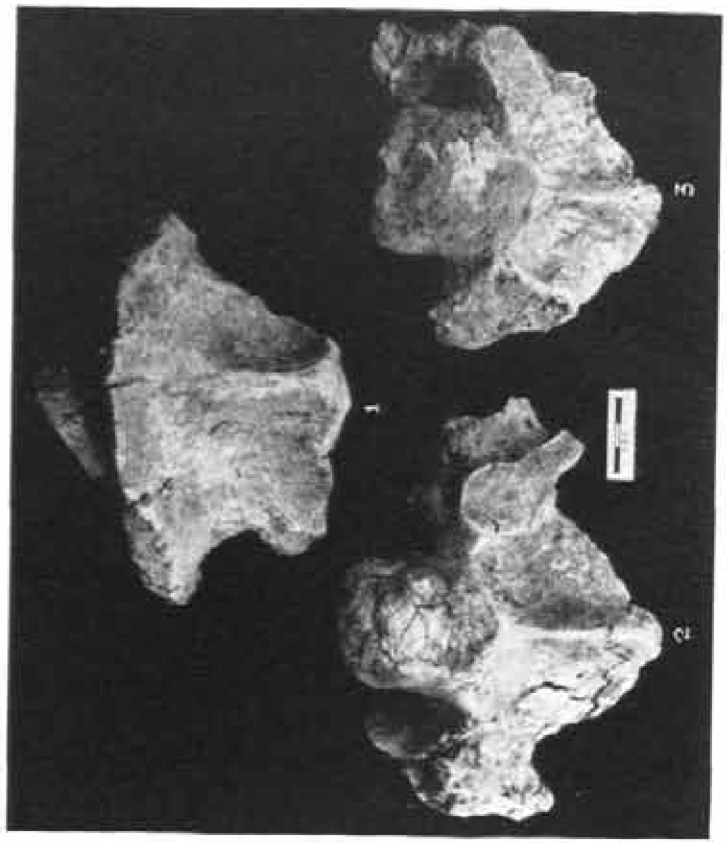
A



B



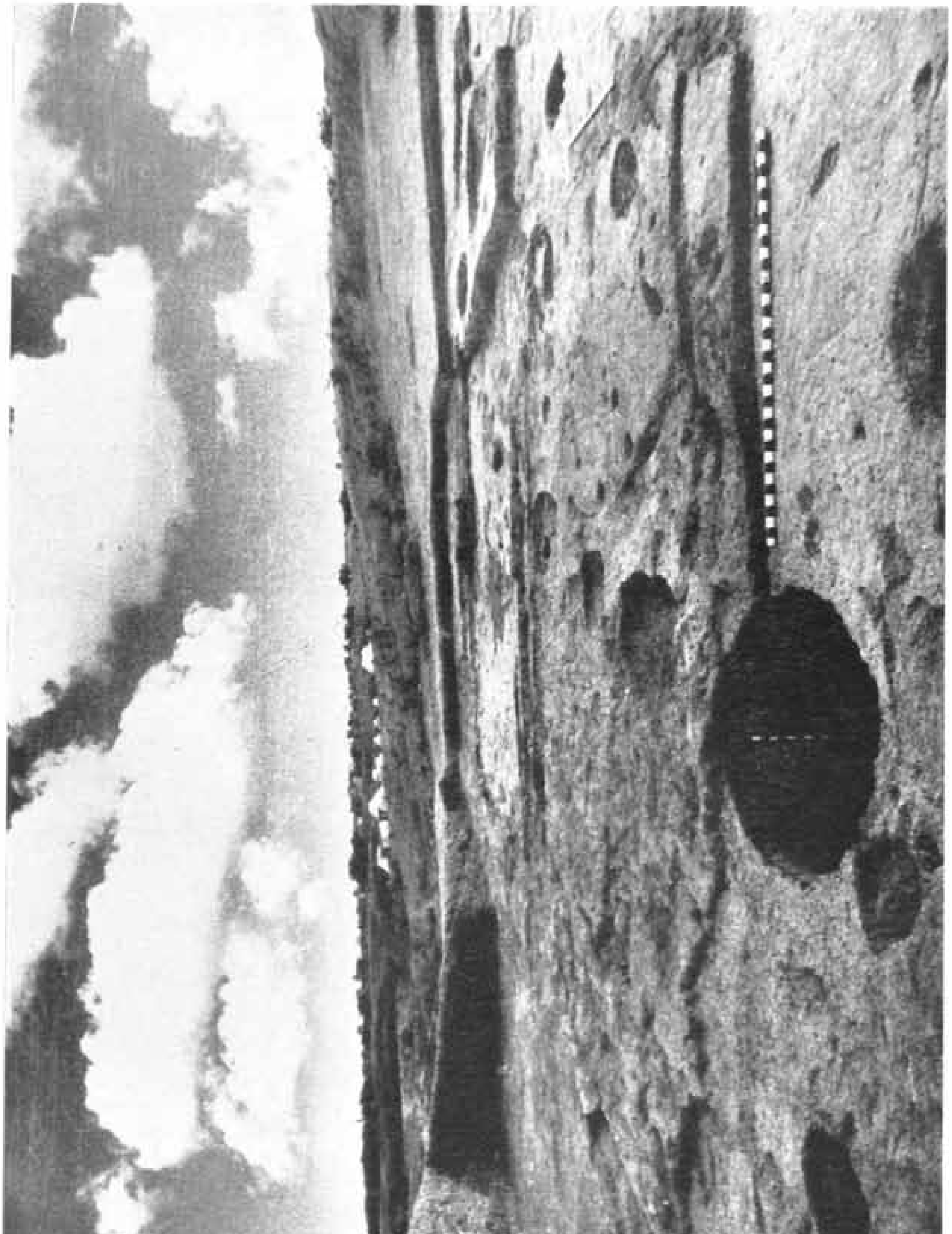
C



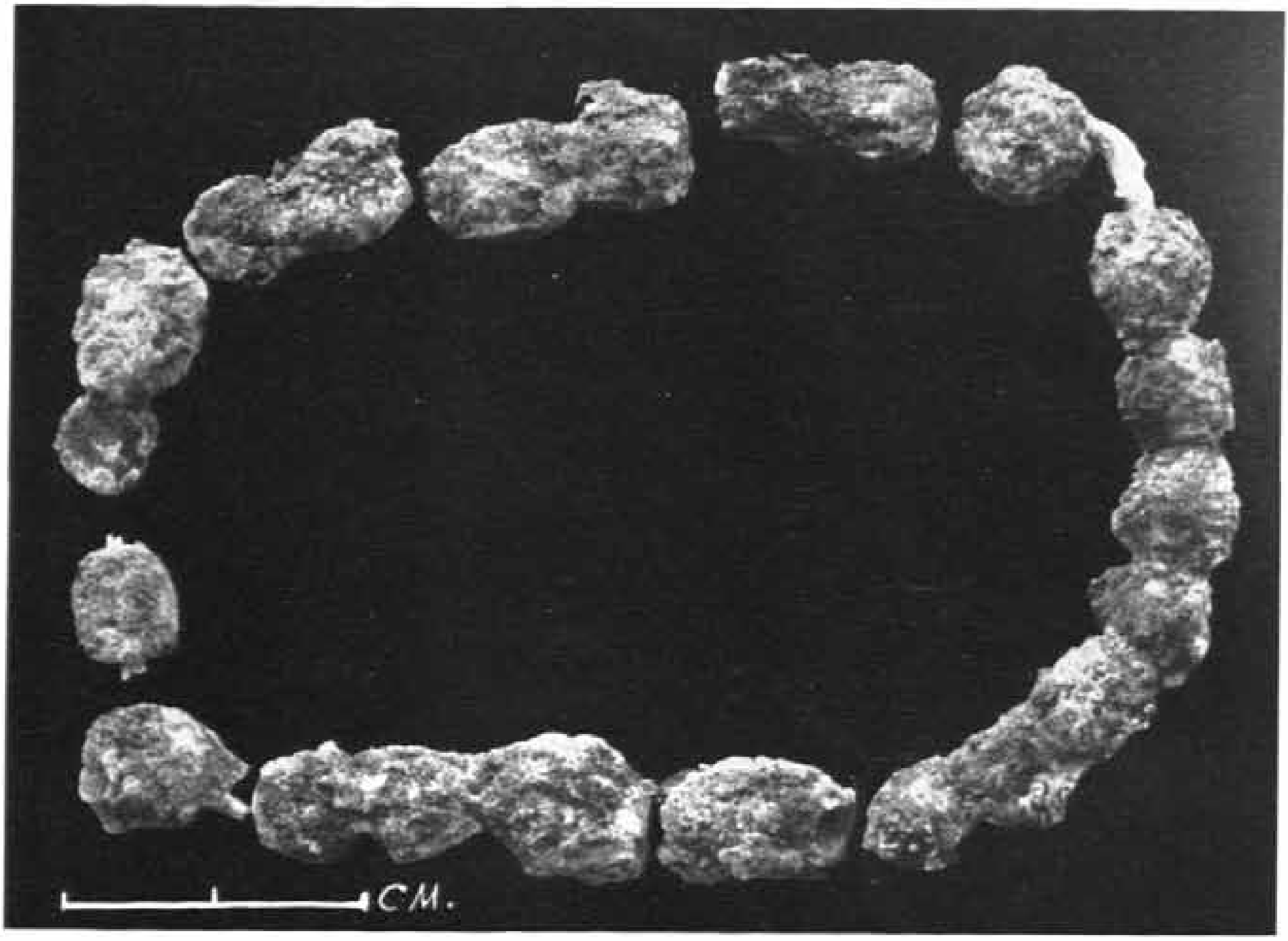
D

A-B, Naikund : lid with bird finial and cup with handle, both in copper; C-D, Nasik : river-section showing older alluvial fill and animal fossil bones

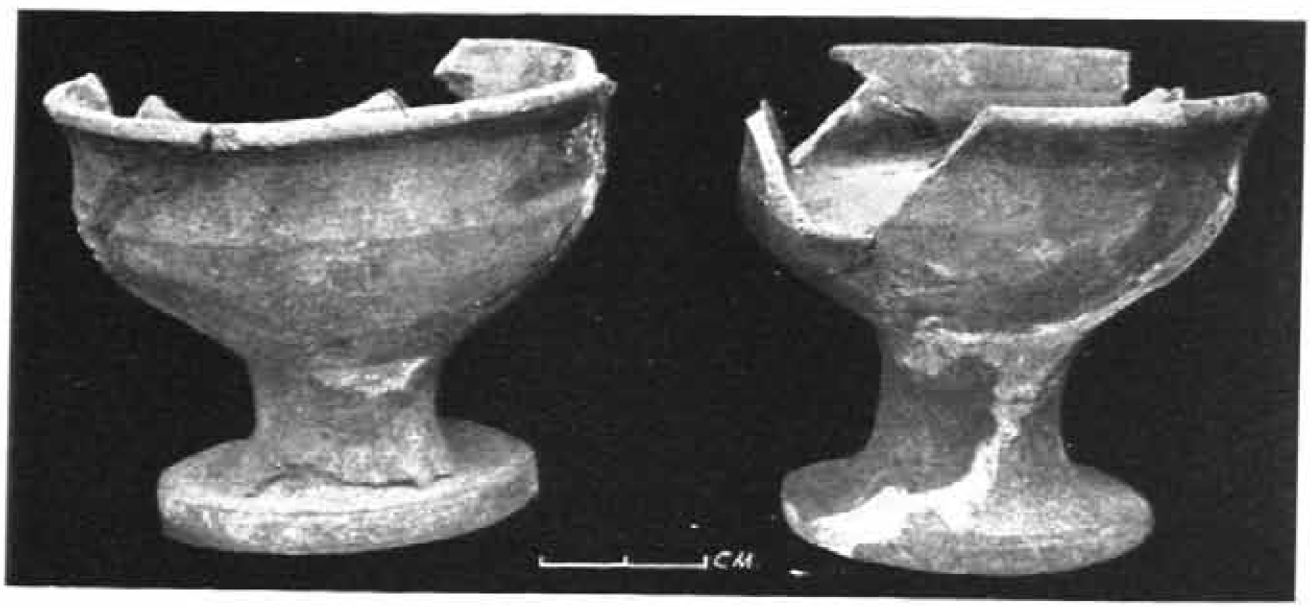
See pp. 39-40



Inamgaon : general view of exposed houses, Period II *See p. 40*

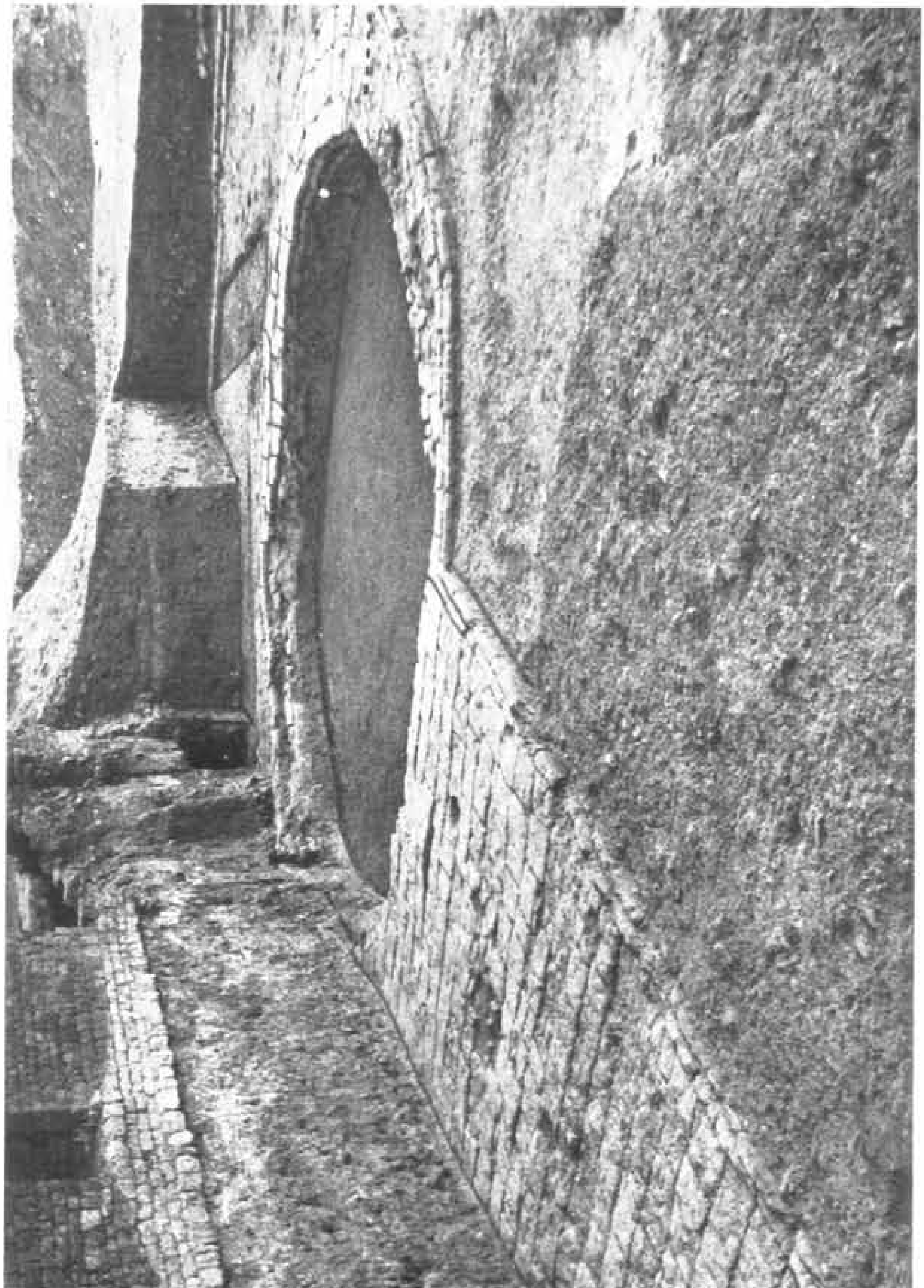


A

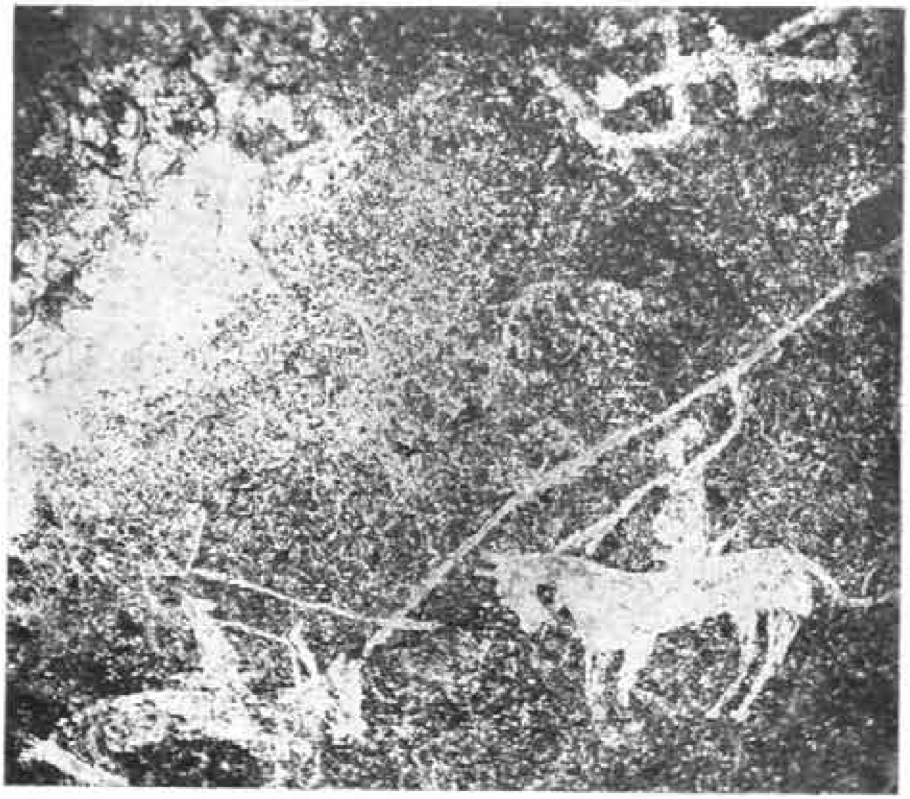


B

Inamgaon : A. *necklace of copper beads*; B. *Chalices in Jorwe Ware, Period II* *See p. 41*



Sanghol : view of exposed structures See p. 43

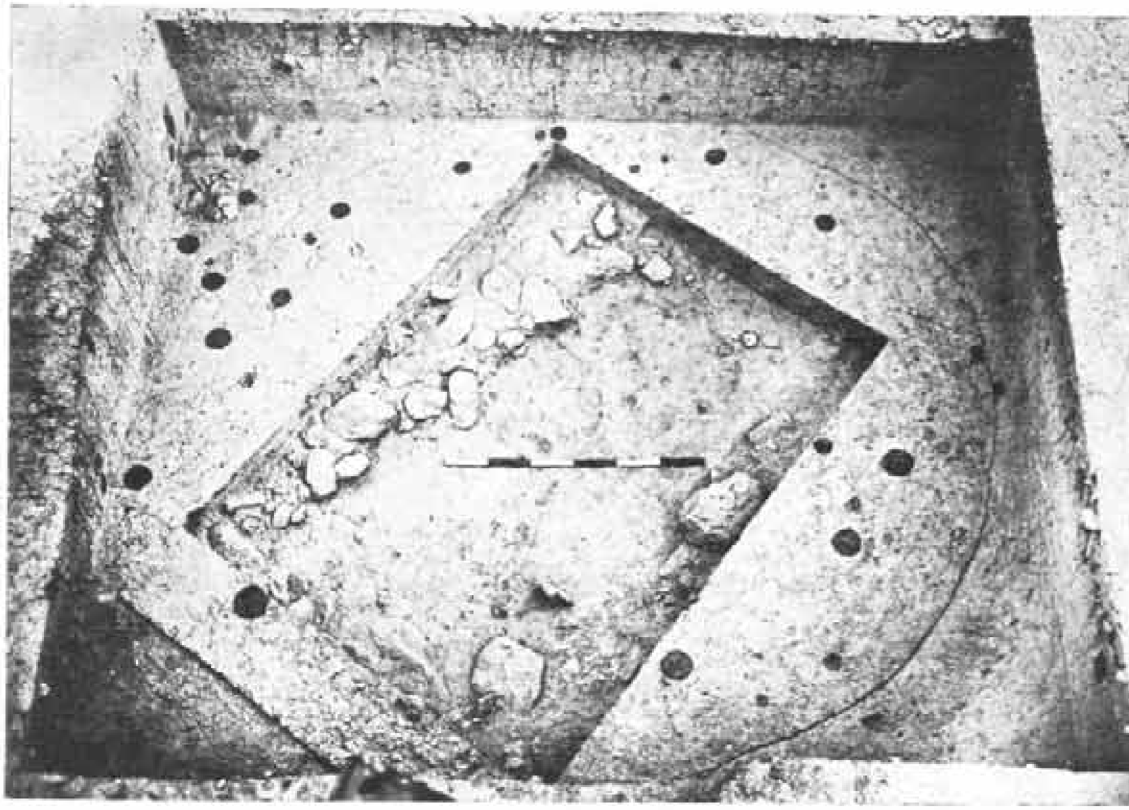


A

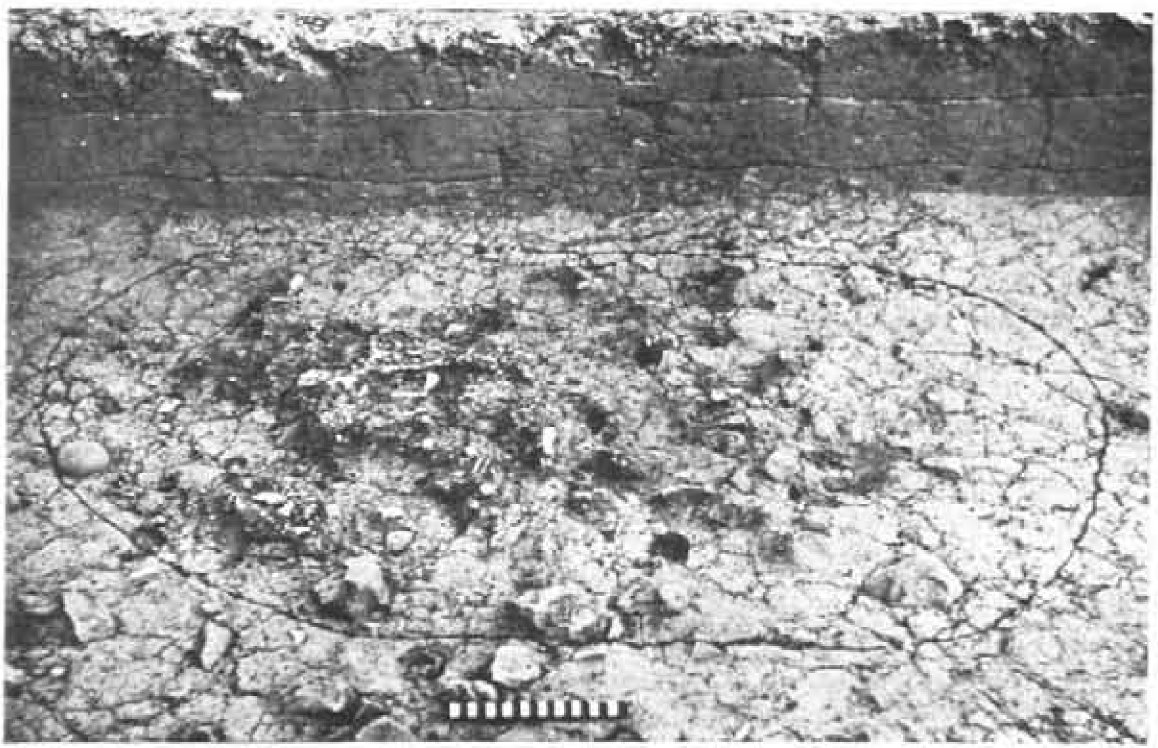


B

Mallappadi : *paintings inside rock-shelter*; B, *Chopani-Mando* : *rice-husk embeded in burnt clay lump* *See pp.* 50 *and* 52

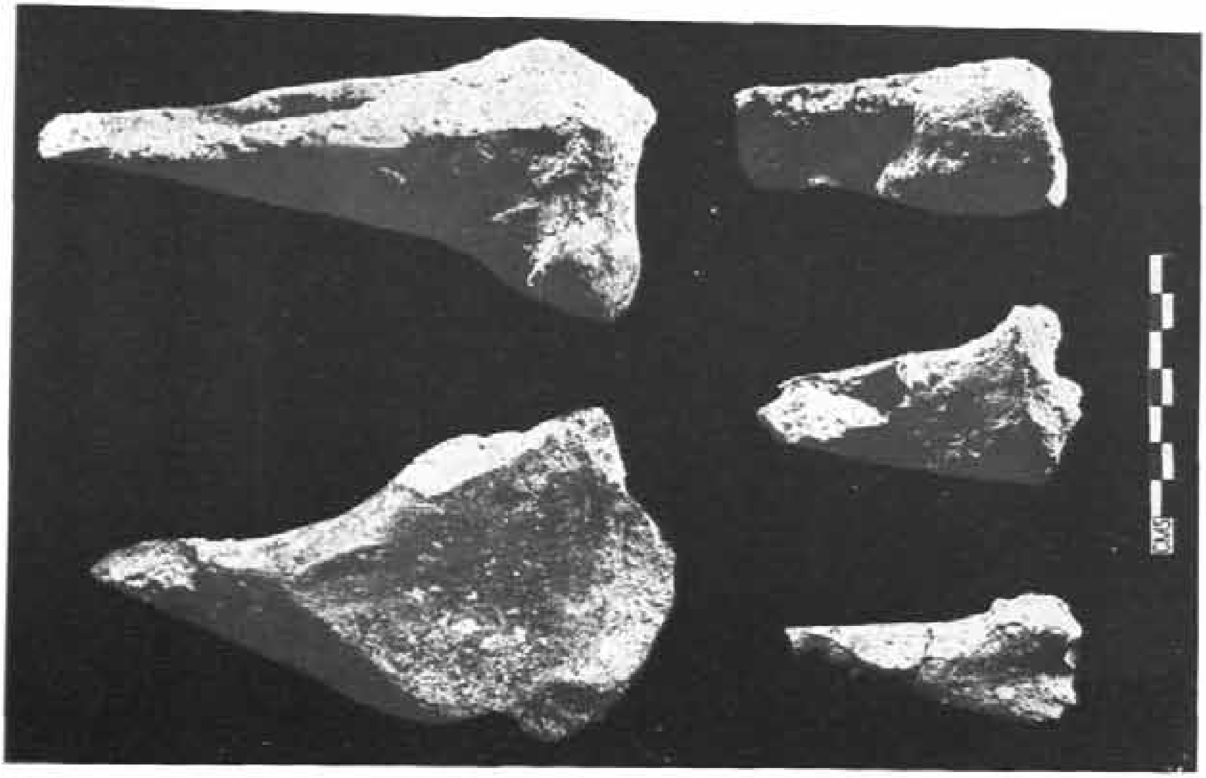


A

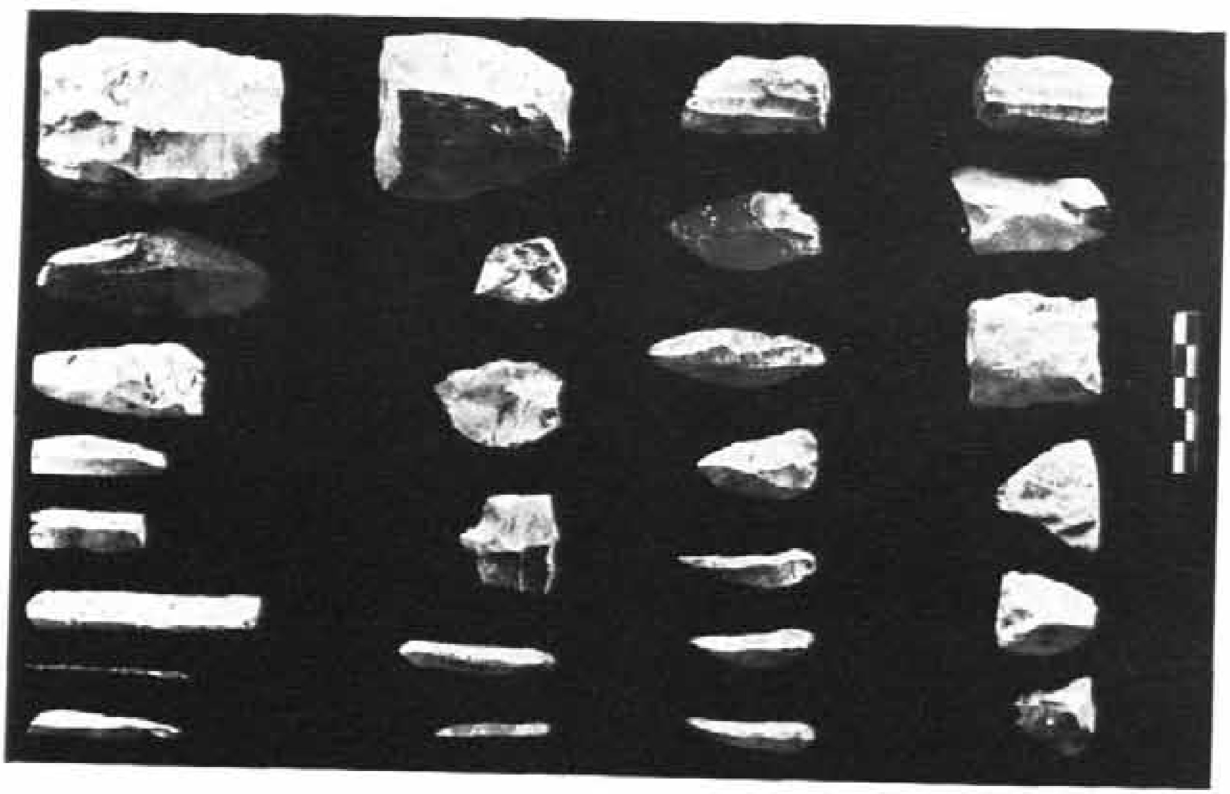


B

Chopani Mando : A, *view showing three cultural phases*; B, *pit-hearth with charcoal and animal bones* *See p. 52*

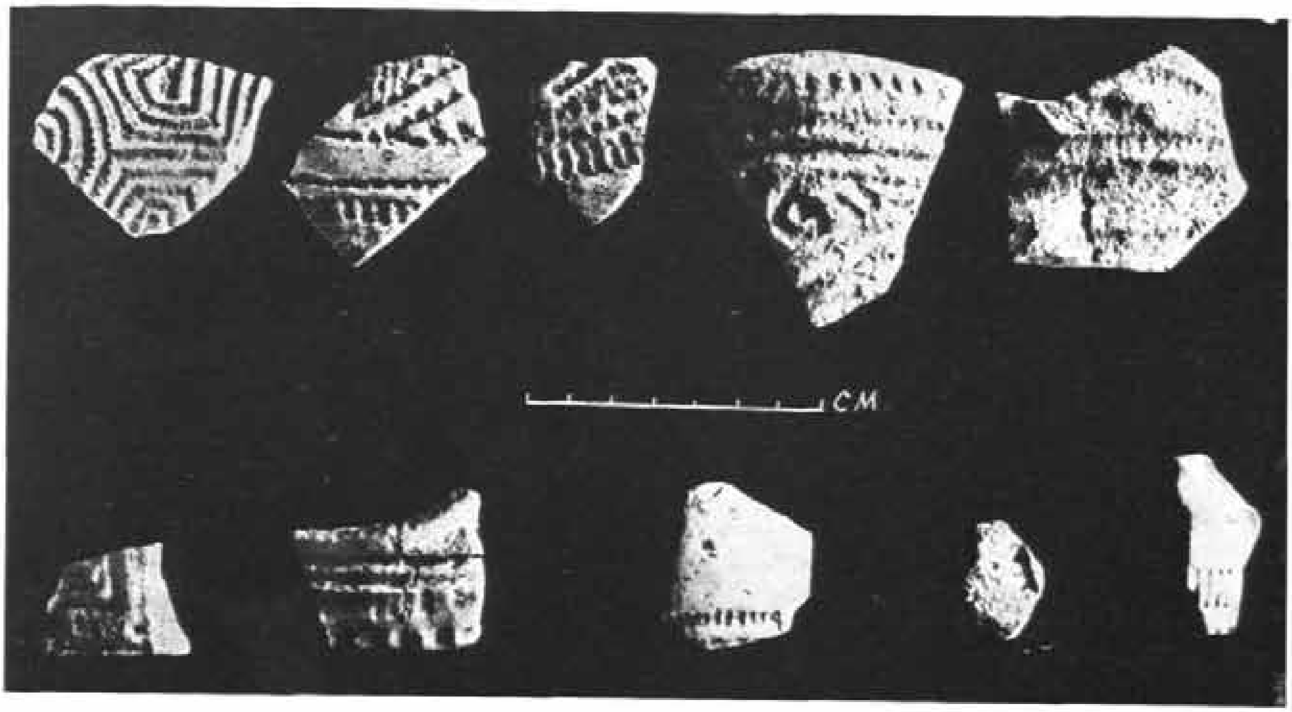


B

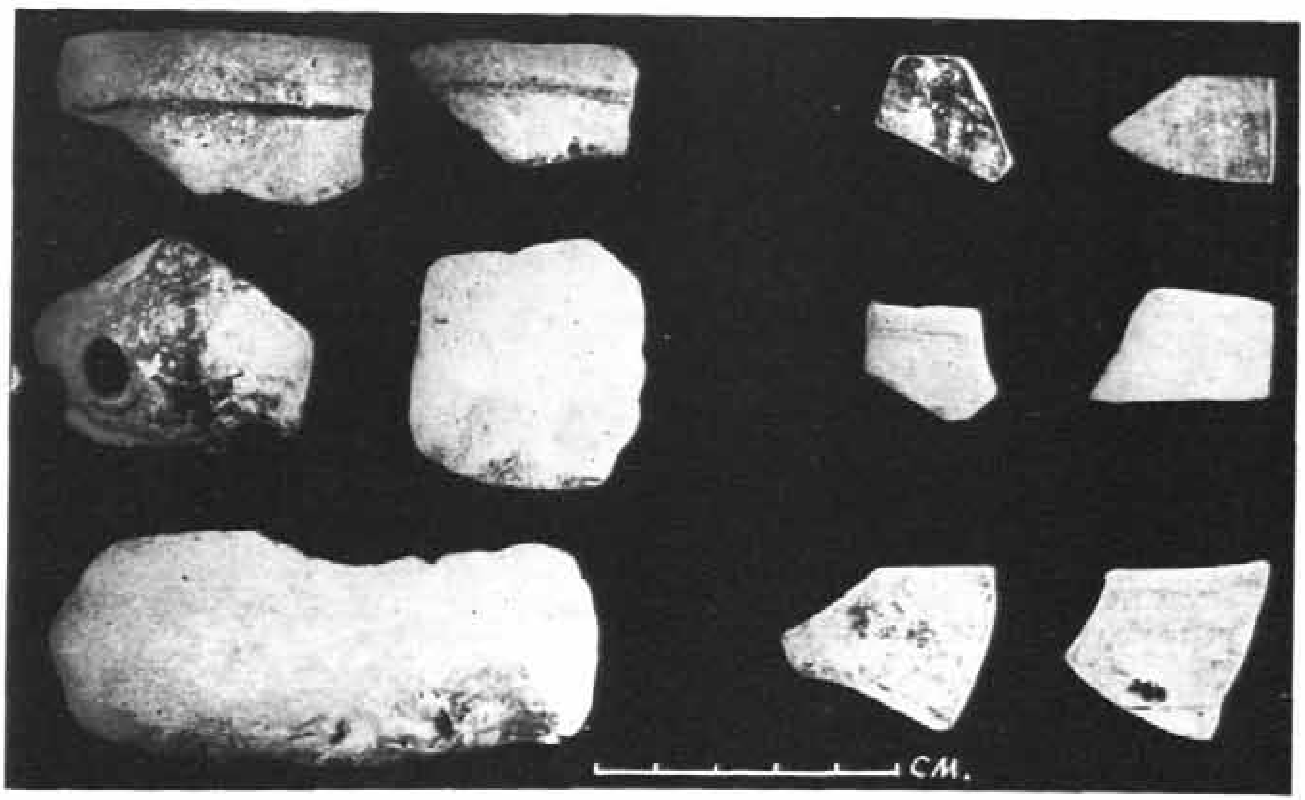


A

Chopani-Mando : A, *Epipalaeolithic (late Upper Palaeolithic)* tools; B, *Mahadaha* : *animal bones with cut-marks* *See pp.* 52 *and* 58

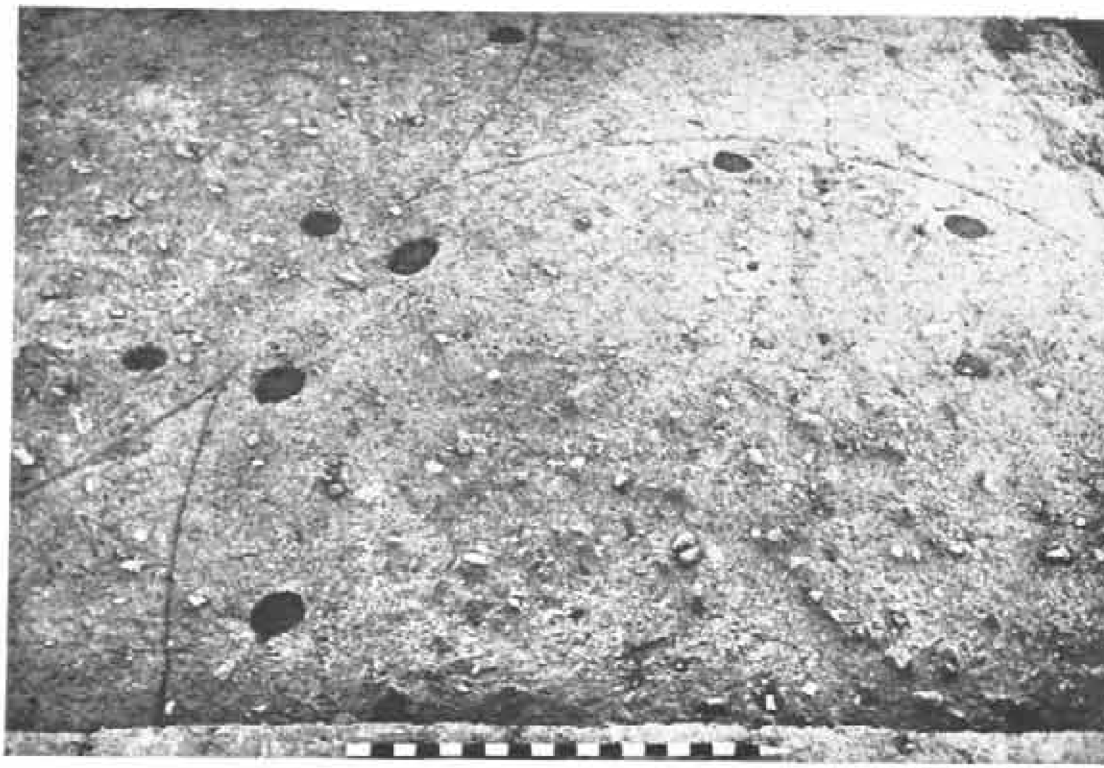


A

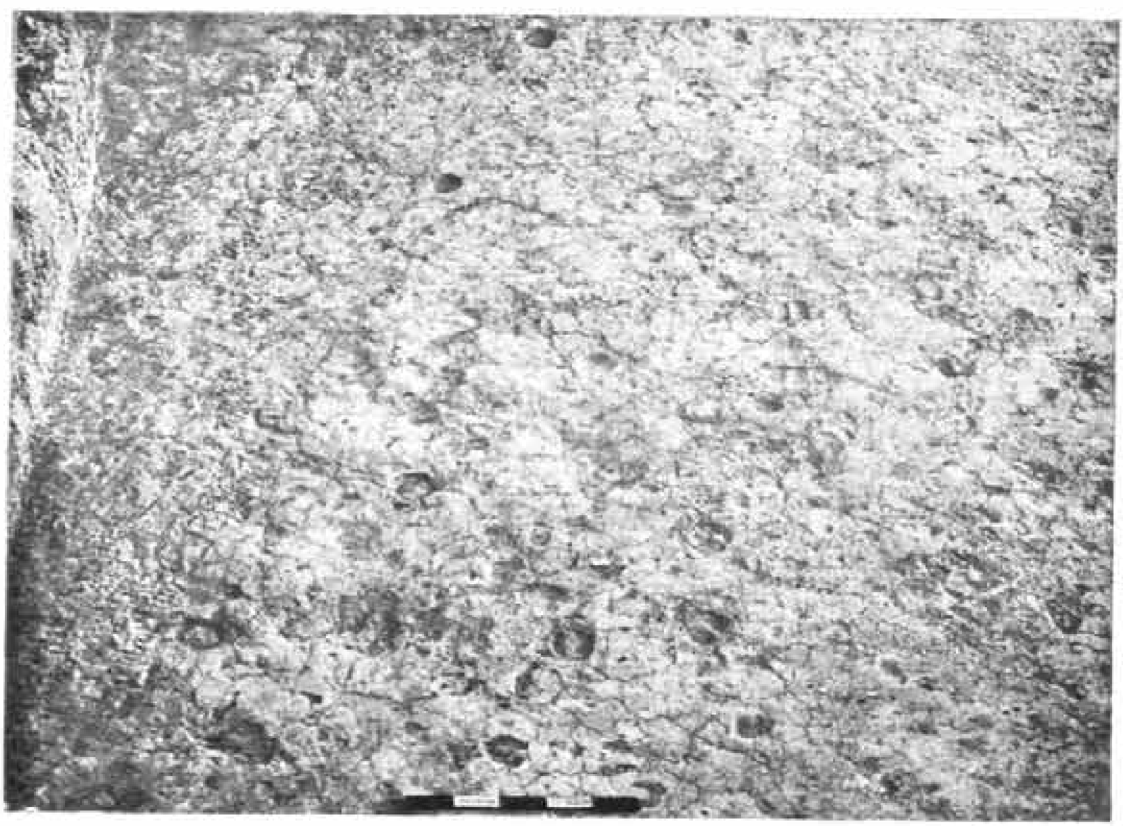


B

Chopani-Mando : decorated potsherds, late Mesolithic; B, chalcolithic pottery from Sai-Gomti doab See. pp. 52 and 57

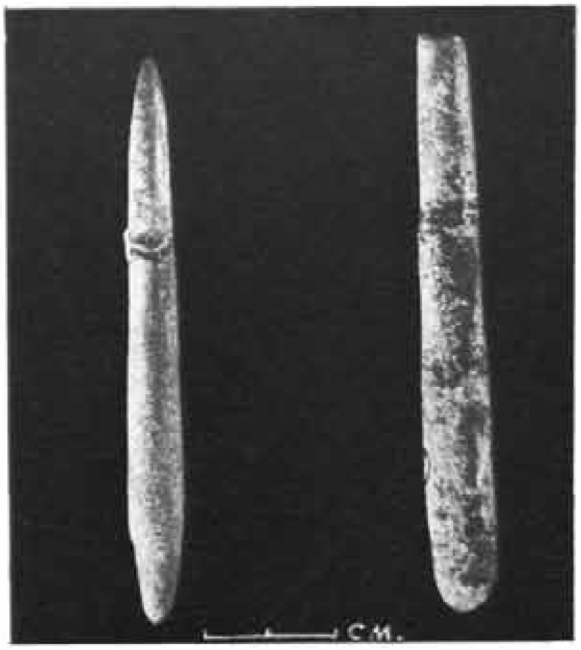


A

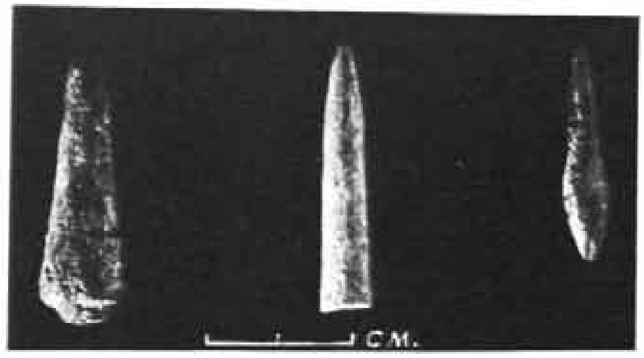


B

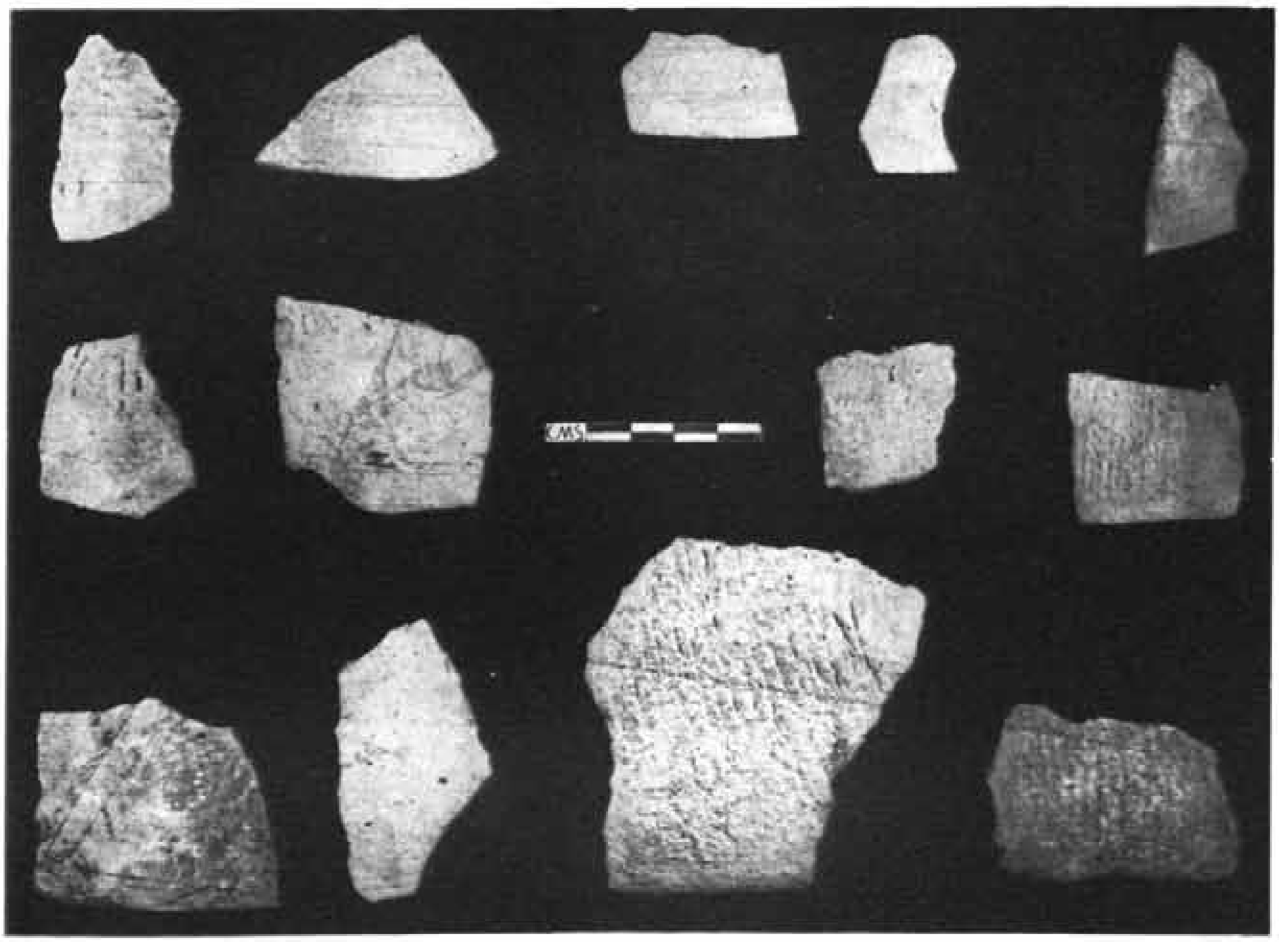
Mahagara : A, *exposed floors with post-holes*; B, *hoof impressions of cattle inside pen* *See p. 52*



A

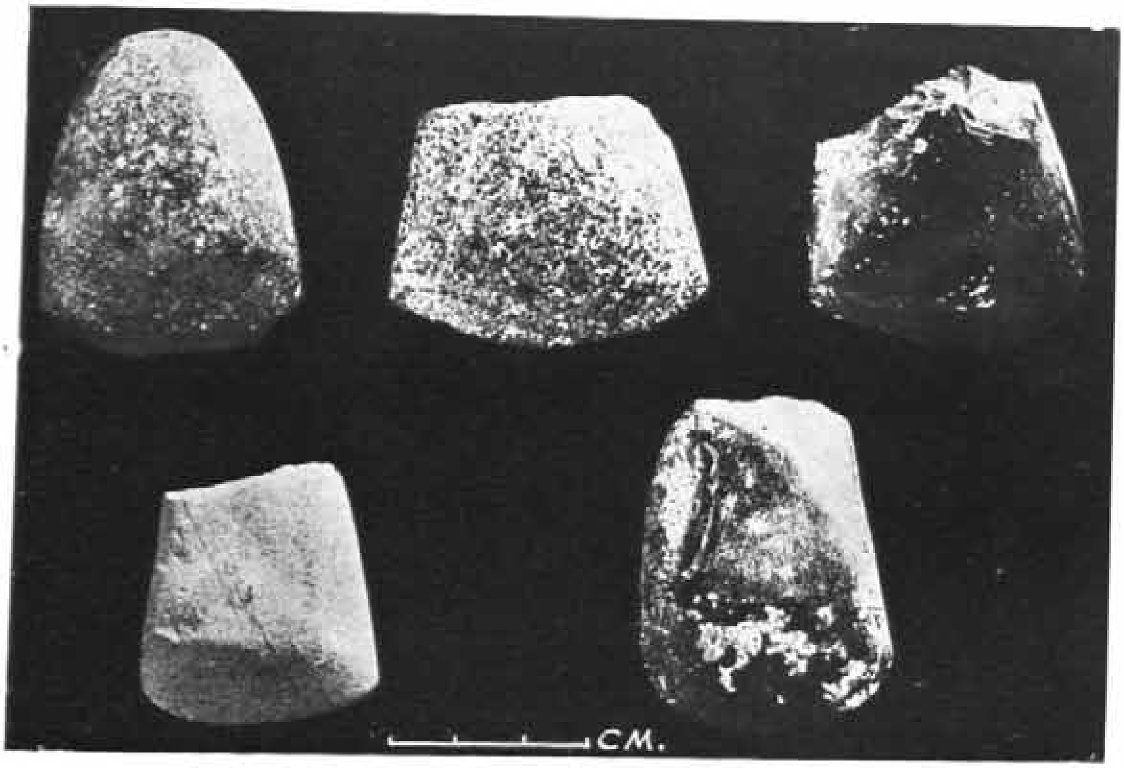


B

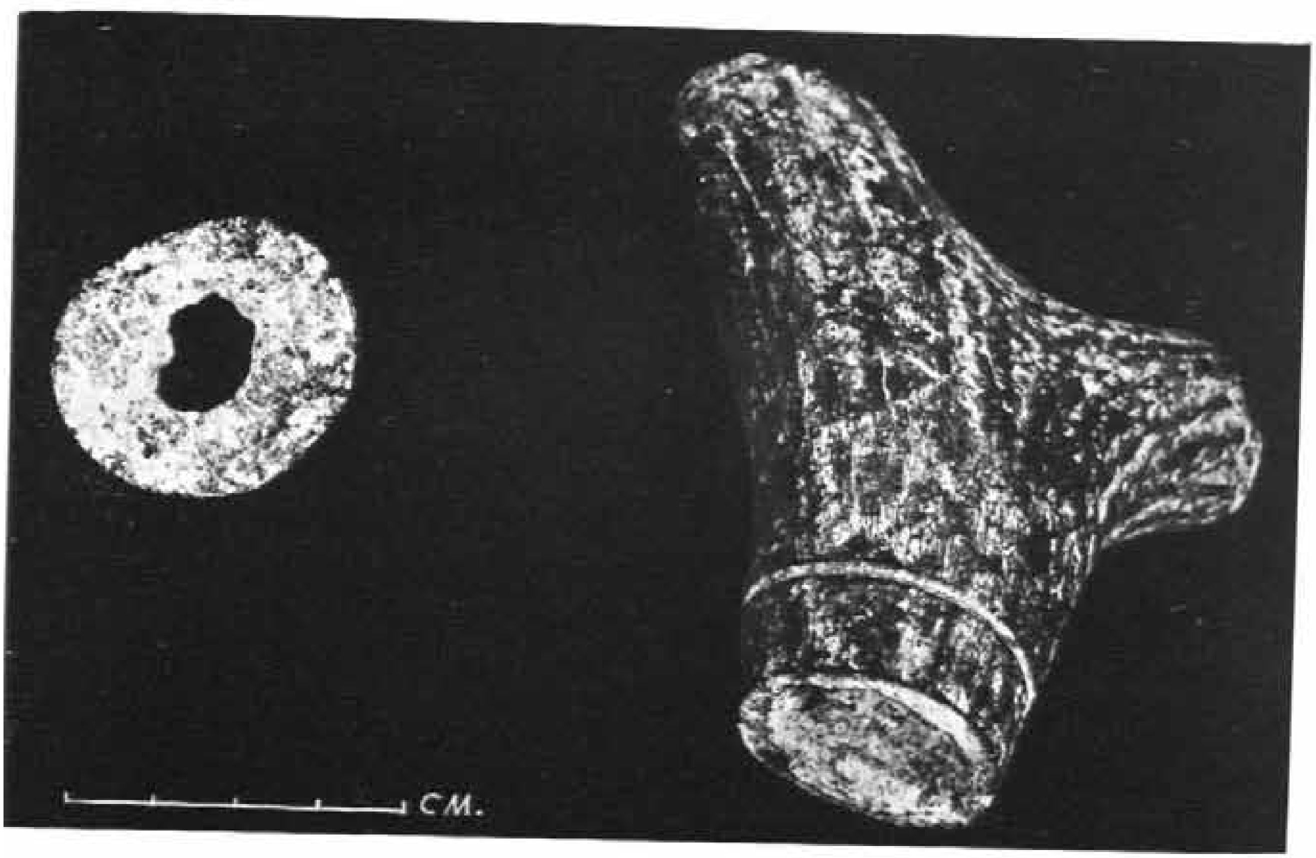


C

Mahagara : A-B, *bone arrowheads*; C, *chalcolithic pottery* *See pp. 52-54*

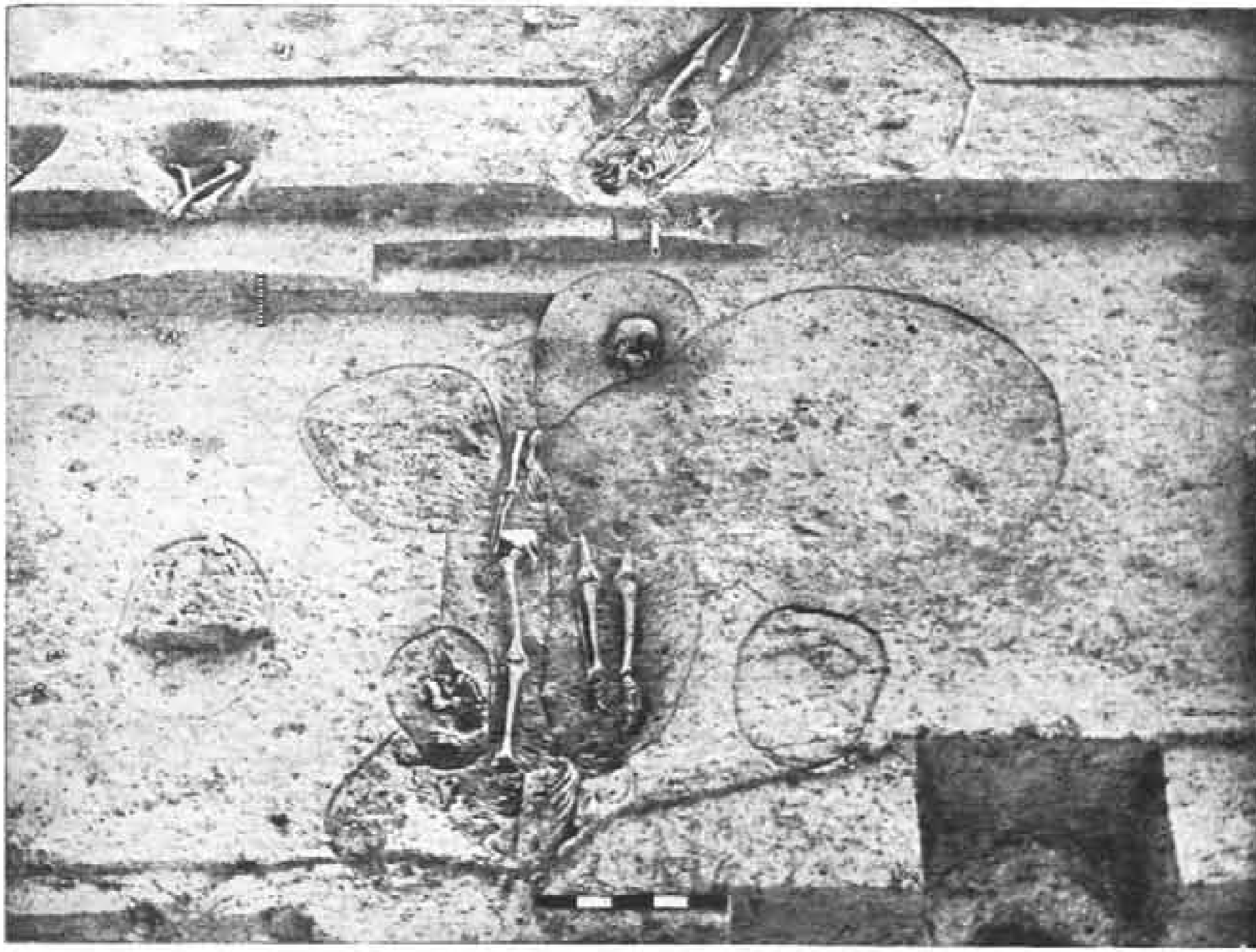


A



B

A, *Mahagara : polished stone tools*; B, *Mahadaha : bone objects* *See pp. 54 and 59*



A



B

Mahadaha : A, *view showing four phases of burials*; B, *double burial, female superimposed over male* *See p. 58*



A

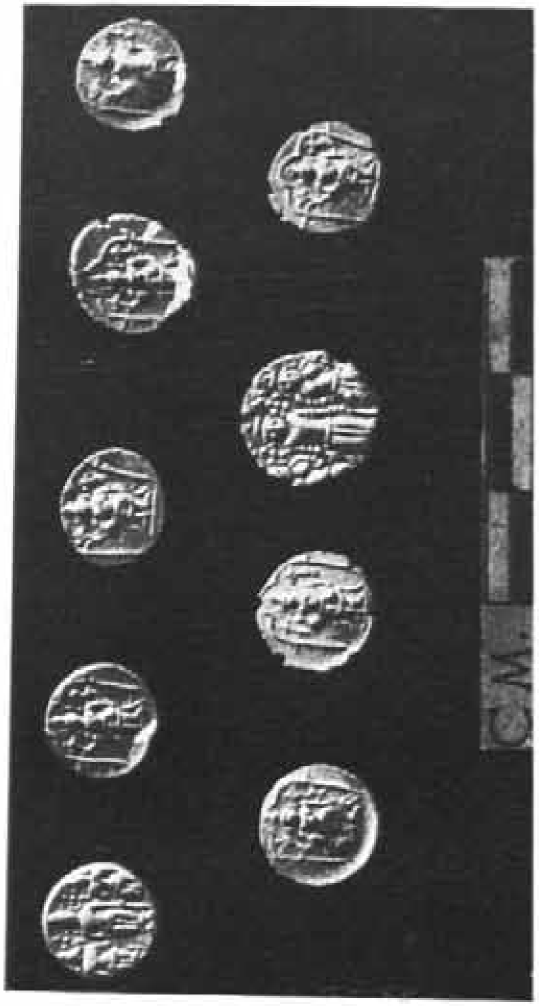


B



C

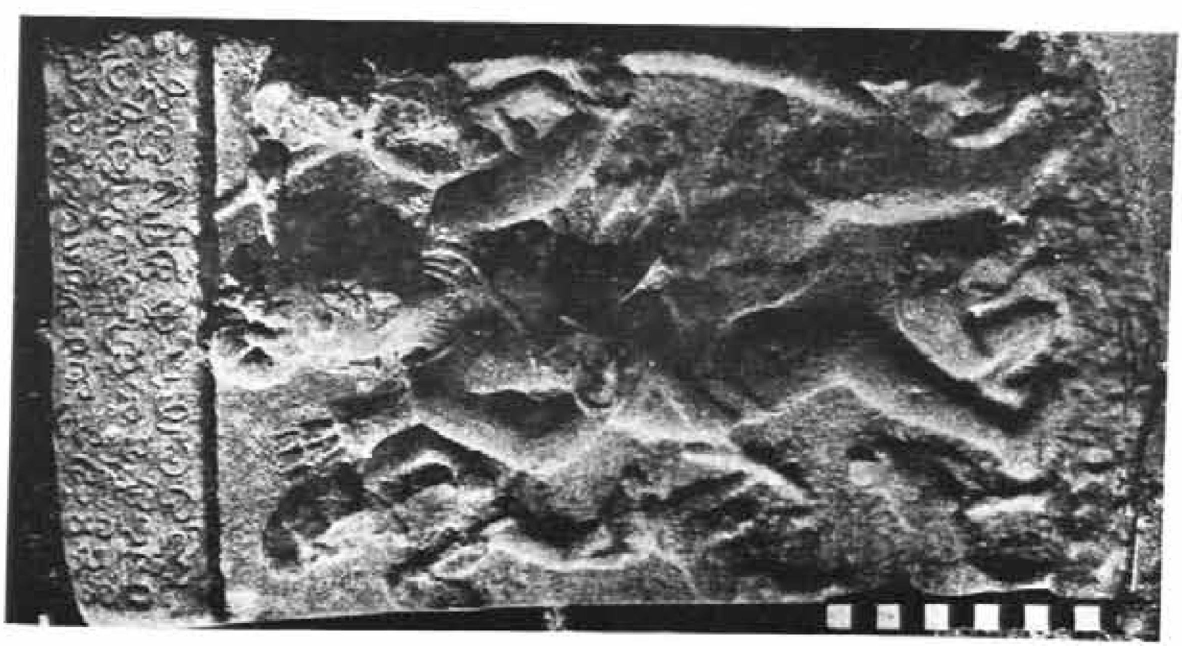
Minor rock-edicts of Asoka : A, Nittur; B-C, Udegolam See p. 63



B



C



A

A, *Madras : hero-stone inscription*; B-C, *Mylavaram : coins of Hindu and Muslim rulers respectively* *See pp. 66 and 73*

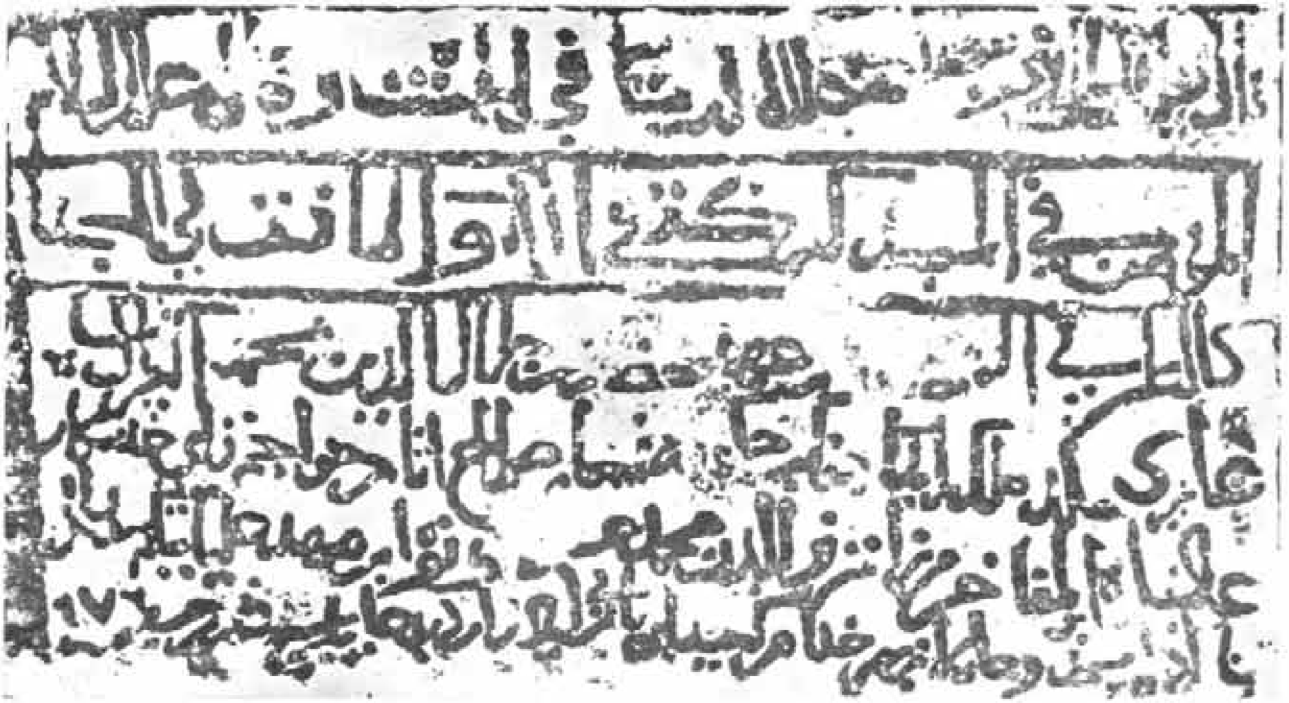


A



B

Tirumalai : Chola inscriptions *See p. 67*

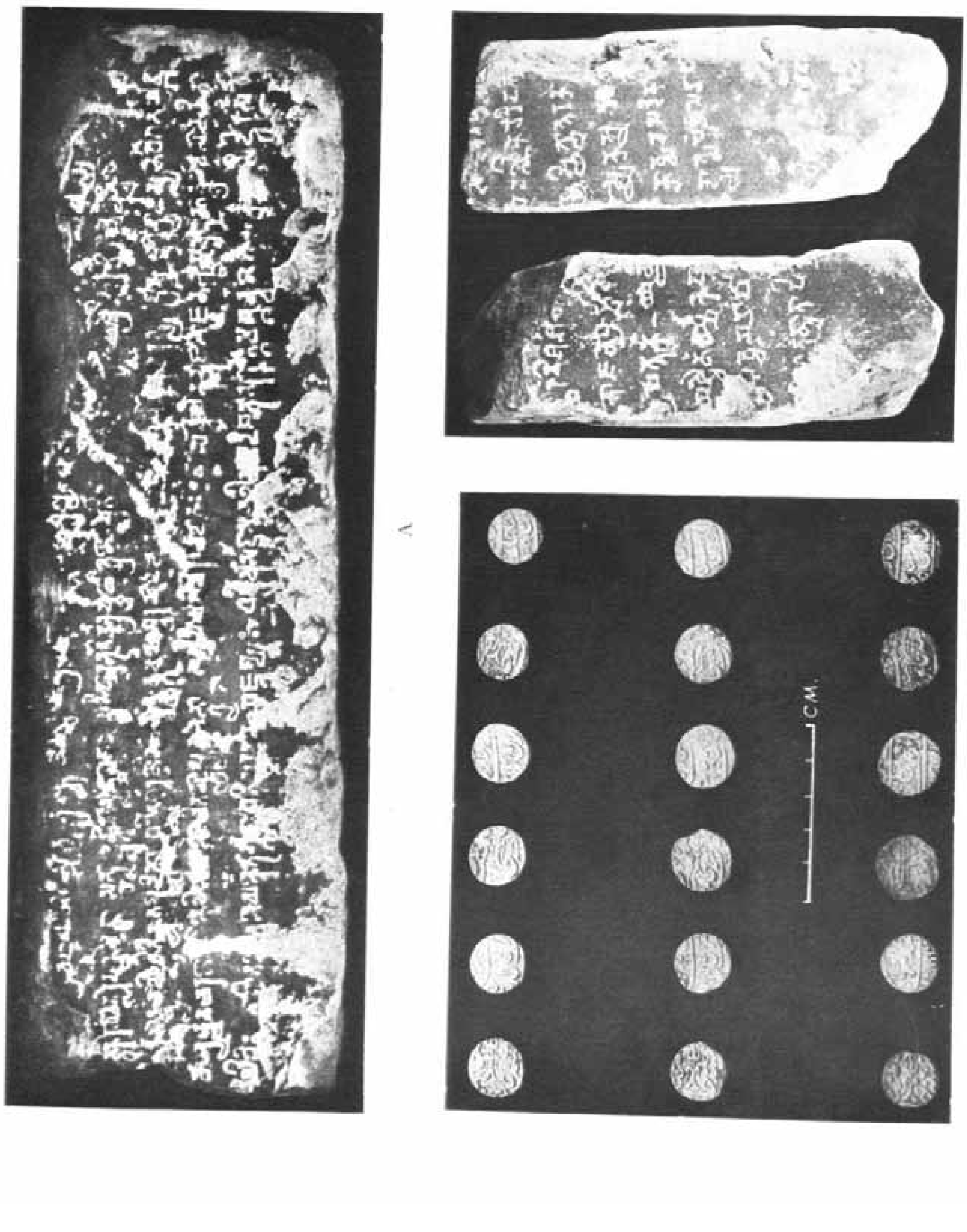


A



B

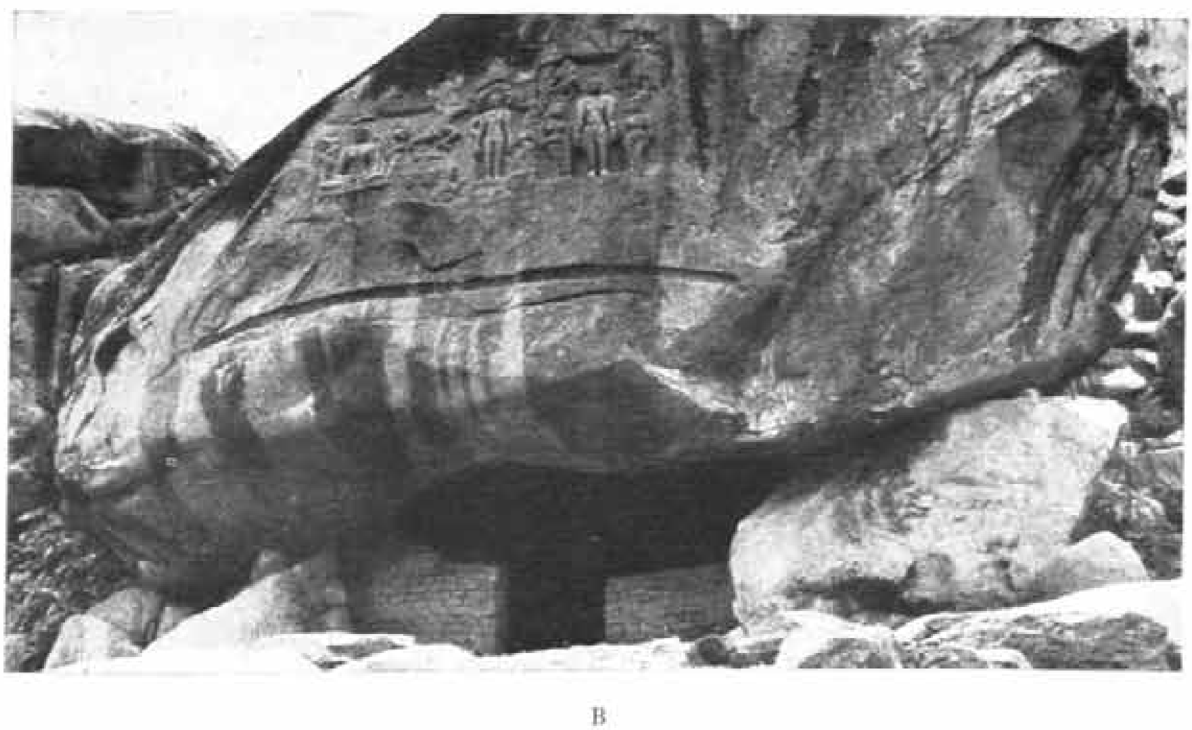
A, *Chhintamoula* ; *inscription of Emperor Akbar* ; B, *Suri* : *inscription of Sultans of Bengal* *See pp. 70 and 72*



A, *Besnagar* : *Gupta inscription*; B, *Bijamandal* : *silver coins of late Mughal rulers*; C, *Garhwa fort* (*Shoorajpur*) : *Gupta inscription* *See pp. 80 and 83*

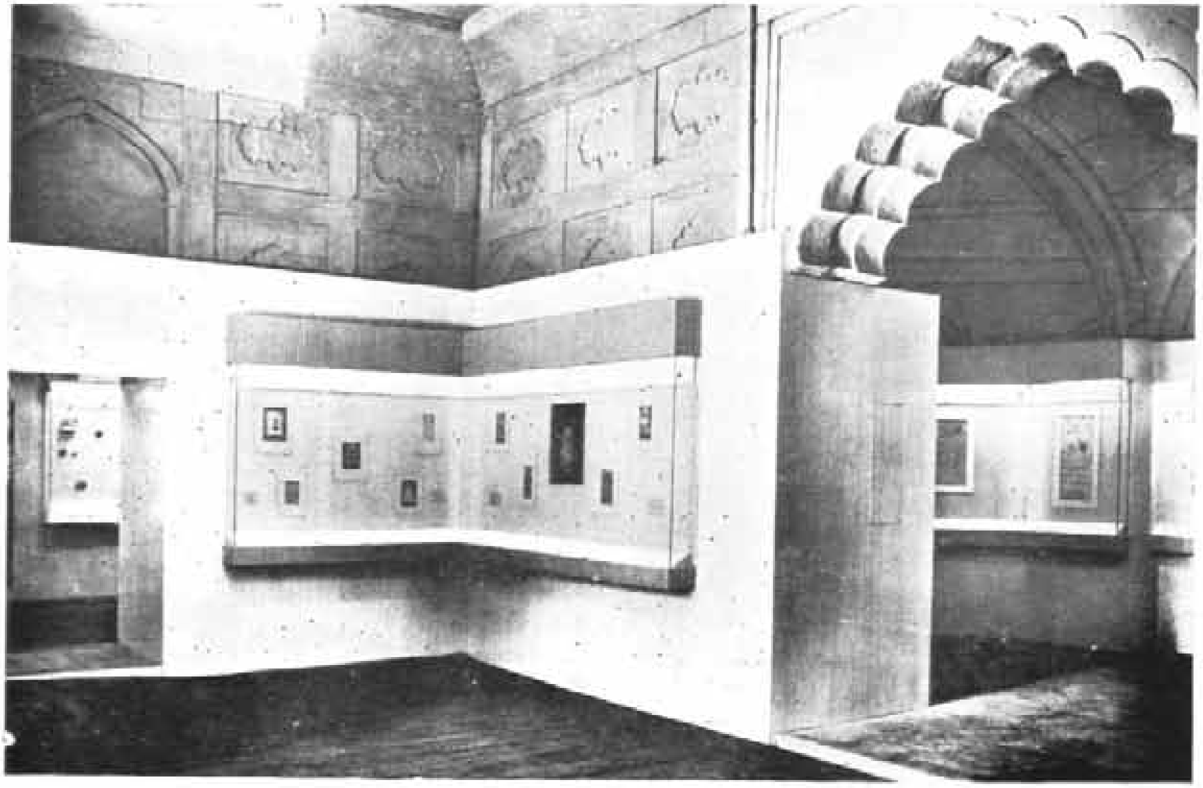


A

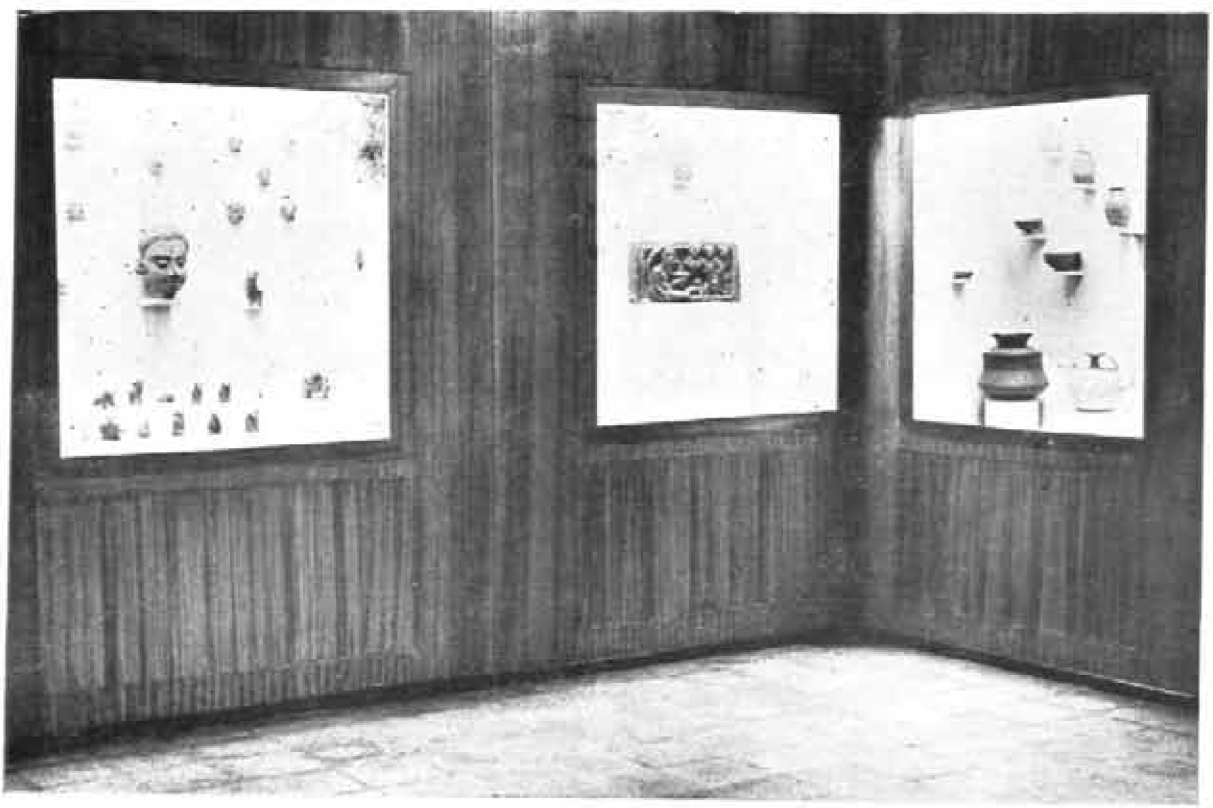


B

A, *Kadagattur* : *terracotta figurine of Kumara*; B. *Siyamangalam* : *bas-relief figures on cavern* *See p. 82*



A



B

A, *Taj Museum, Agra : view of galleries*; B, *Indian Museum, Calcutta : view of gallery of 'Minor Art, Historical Period'* *See pp. 94-95*



A

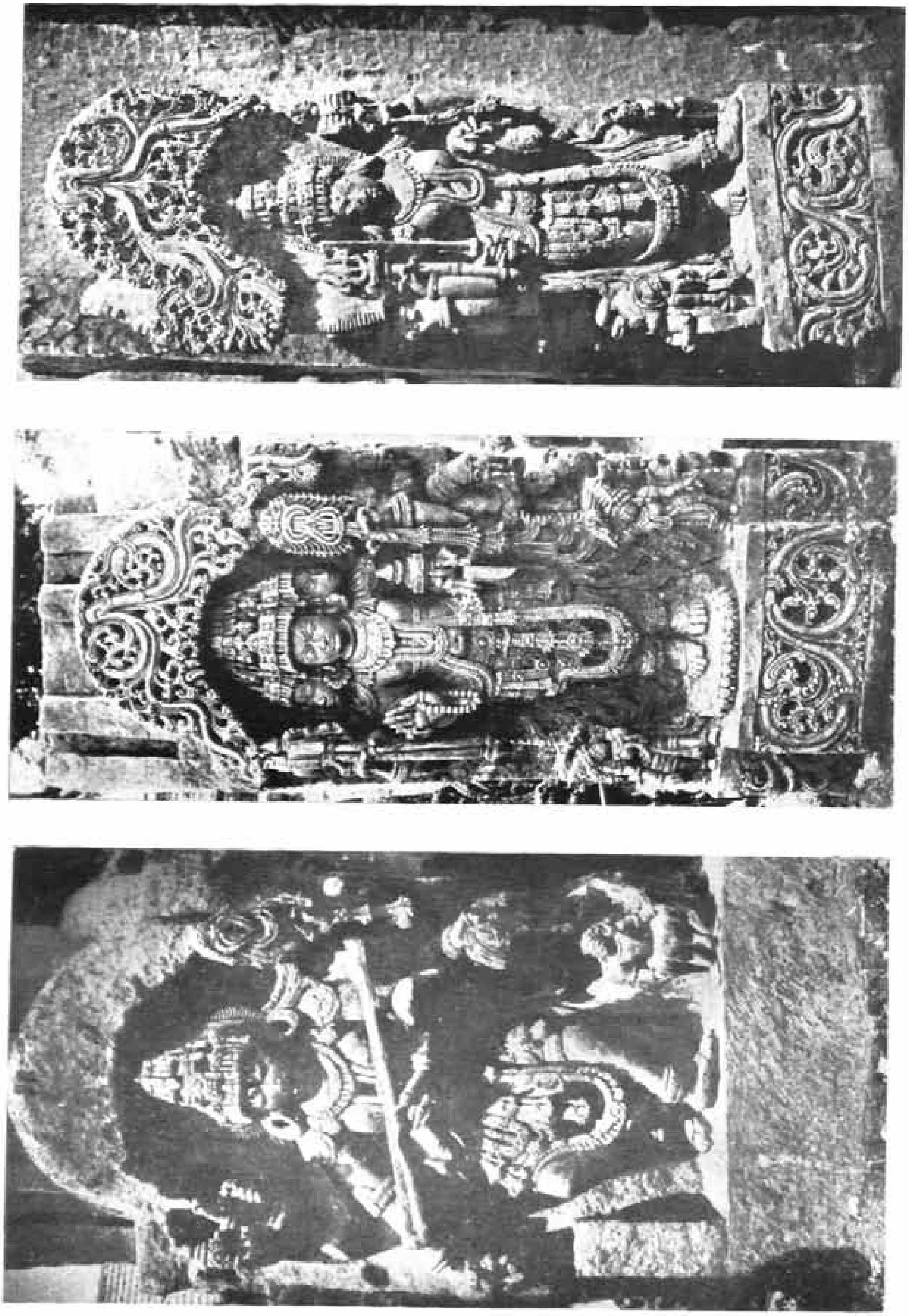


B



C

A, *Indian Museum, Calcutta* : *view of exhibits*; B, *State Museum, Lucknow* : *clay seal*; C, *Government Museum, Mathura* : *bust of yaksha, Kushana period* *See pp.* 95-96



A B C

Archaeological Museum, Halebid : sculptures of A, *Sarasvati*; B, *Trimurti*; C, *Bhairavi* *See p. 96*





A B

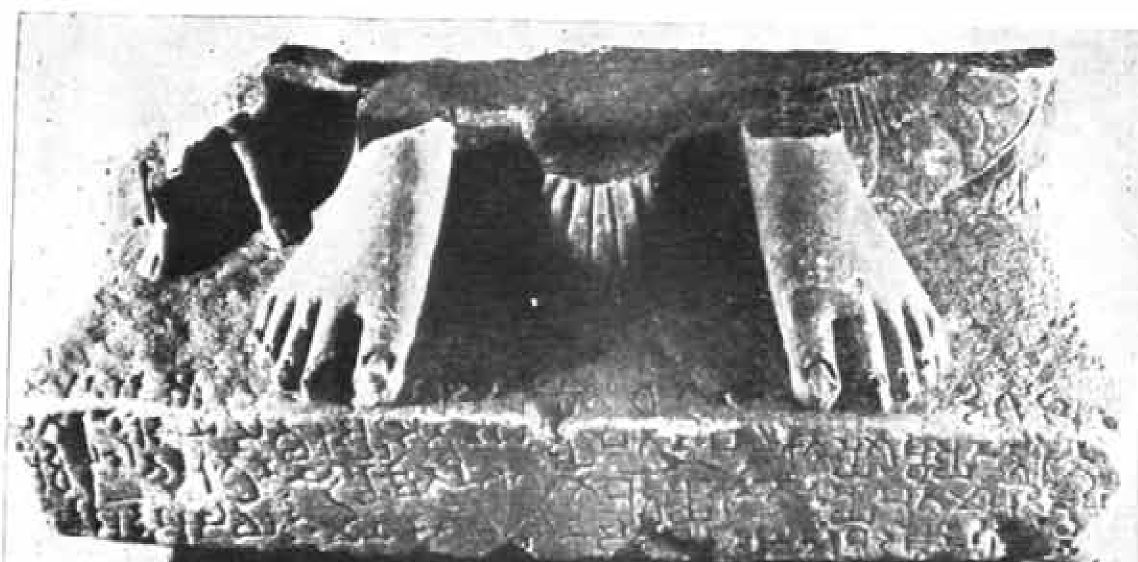
State Museum, Lucknow: A, yaksha figure from Kausambi; B, human head from Hulaskhera *See p. 96*



A



C



B

Government Museum, Mathura : A, *Saivite image, Kushana period*; B, *inscribed pedestal*; C, *image of Vishnu as Vamana* *See p. 97*



A



B



C

National Museum, New Delhi : A, *sculpture of Naga Muchalinda from Pauni, Sunga period*; B, *bearded head in Pratihara style from Mandor*; C, *image of Skandamata from Sagar* *See p. 97*



A



B

A, *Bateśara* : *main group of temples*; B. *Nareśar* : *group of temples* See p. 99





A B

A. Balesara : Kalyanasundara form of Siva; B. *Deogarh : Kuraiya Bir temple* *See p. 99*



B



A

A, Gangavara : elephant-based pillar; B, Doddsivara : Vishnu image with inscription See pp. 101-102



A



B

A. *Gangavara : gopura-dvara of Somesvara temple*; B. *Manne : window with jali work, Kapilesvara temple* *See p. 101*

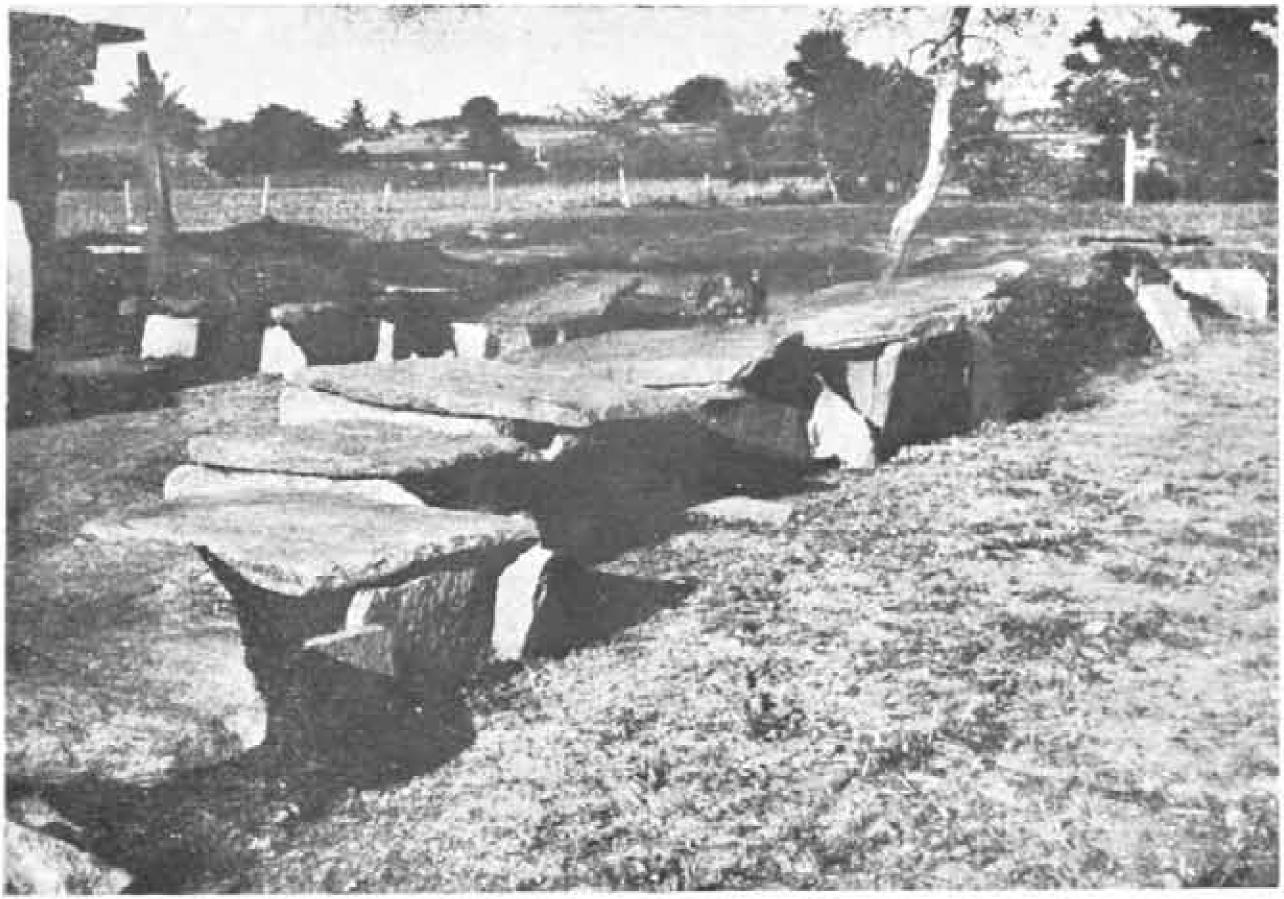


A



B

Manne : A, *view of Kapileswara temple*; B, *brick-built adhishthana of the same temple* *See p. 101*

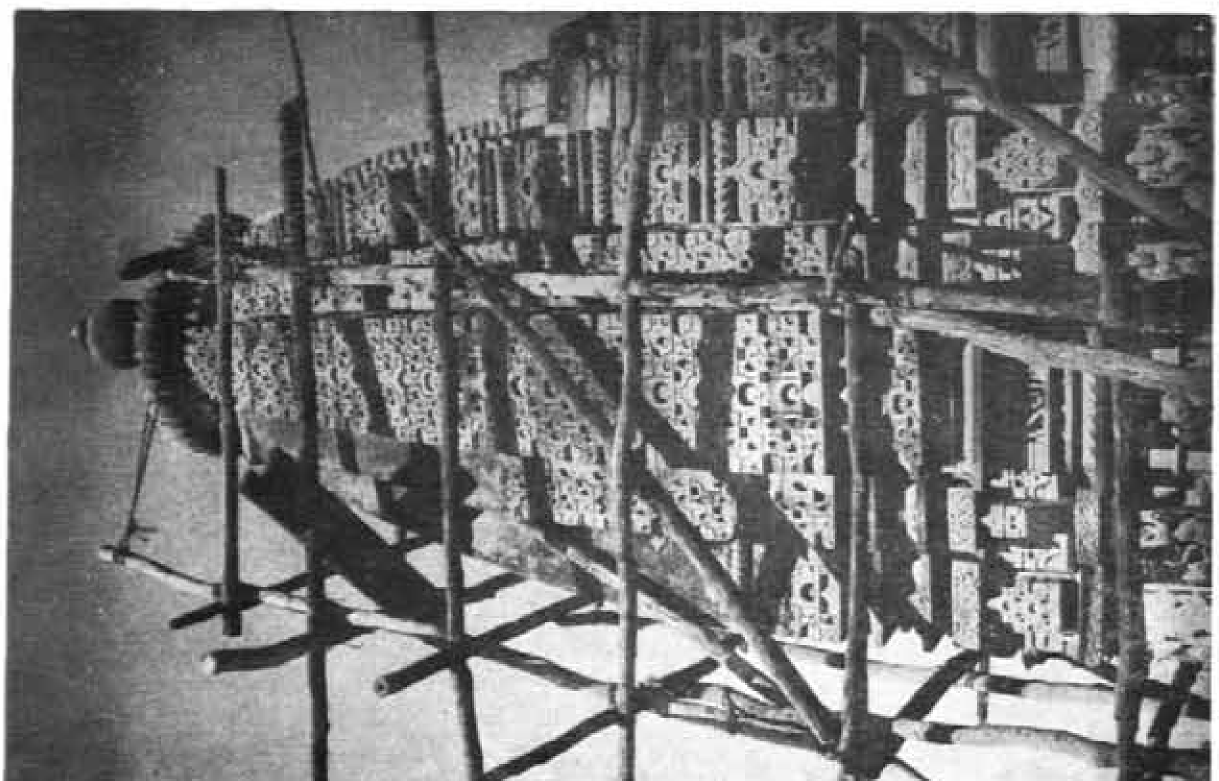


A

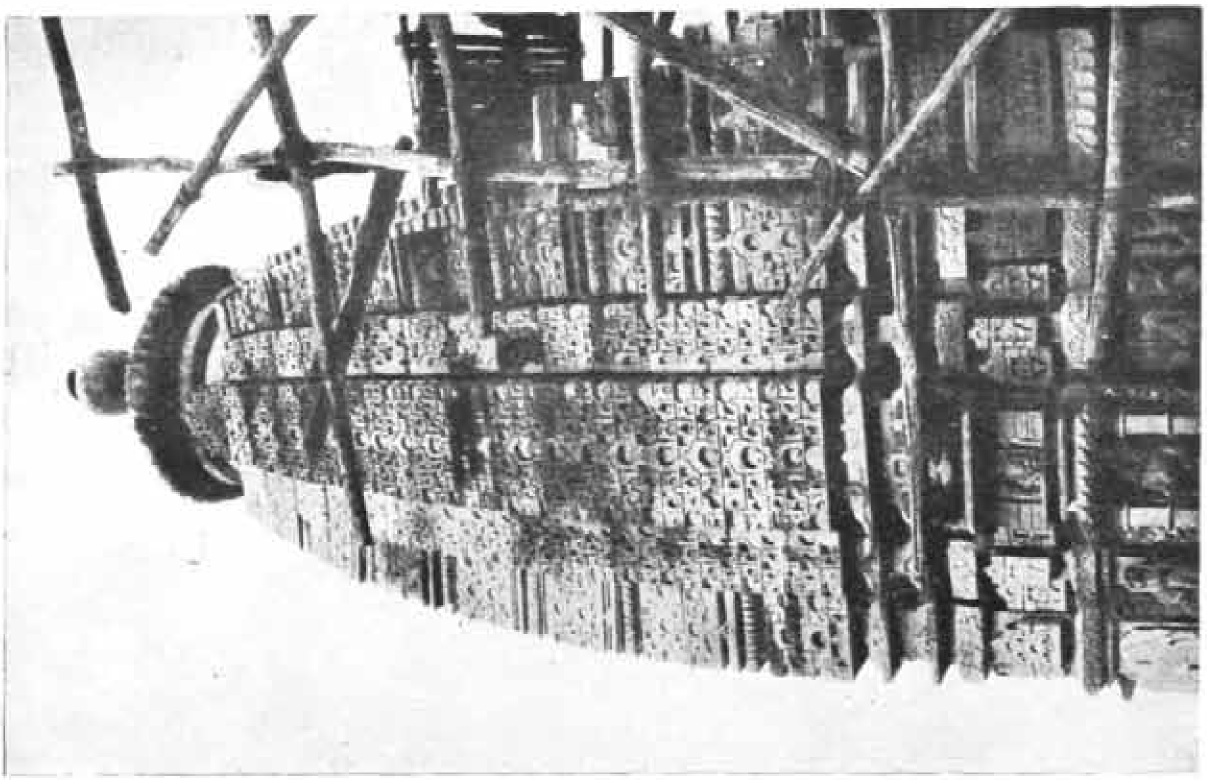


B

A, *Dodshivara : dolmen-like shrines*; B, *Madivala : Saptamatrika shrine* *See p. 102*



A



B

Khajuraho, Lakshmana temple : A, *before and* B, *after conservation* *See p. 103*

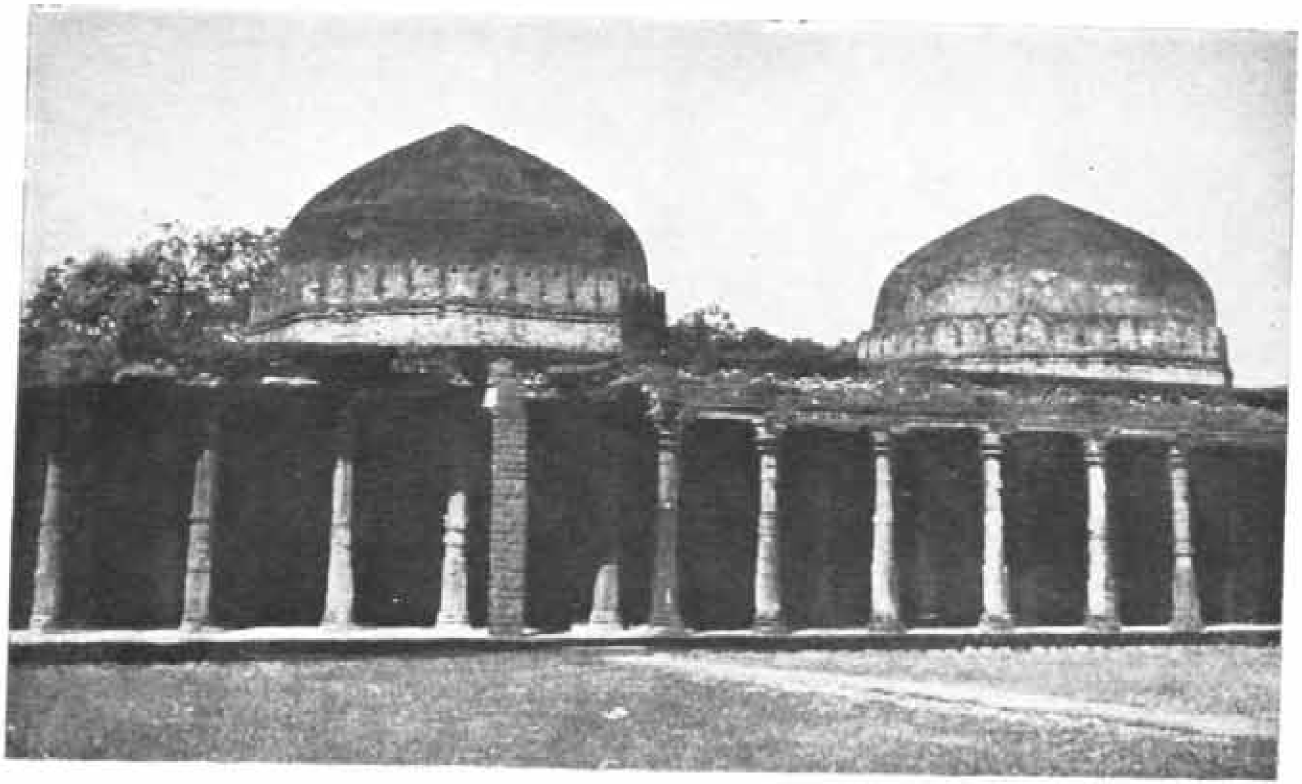


A

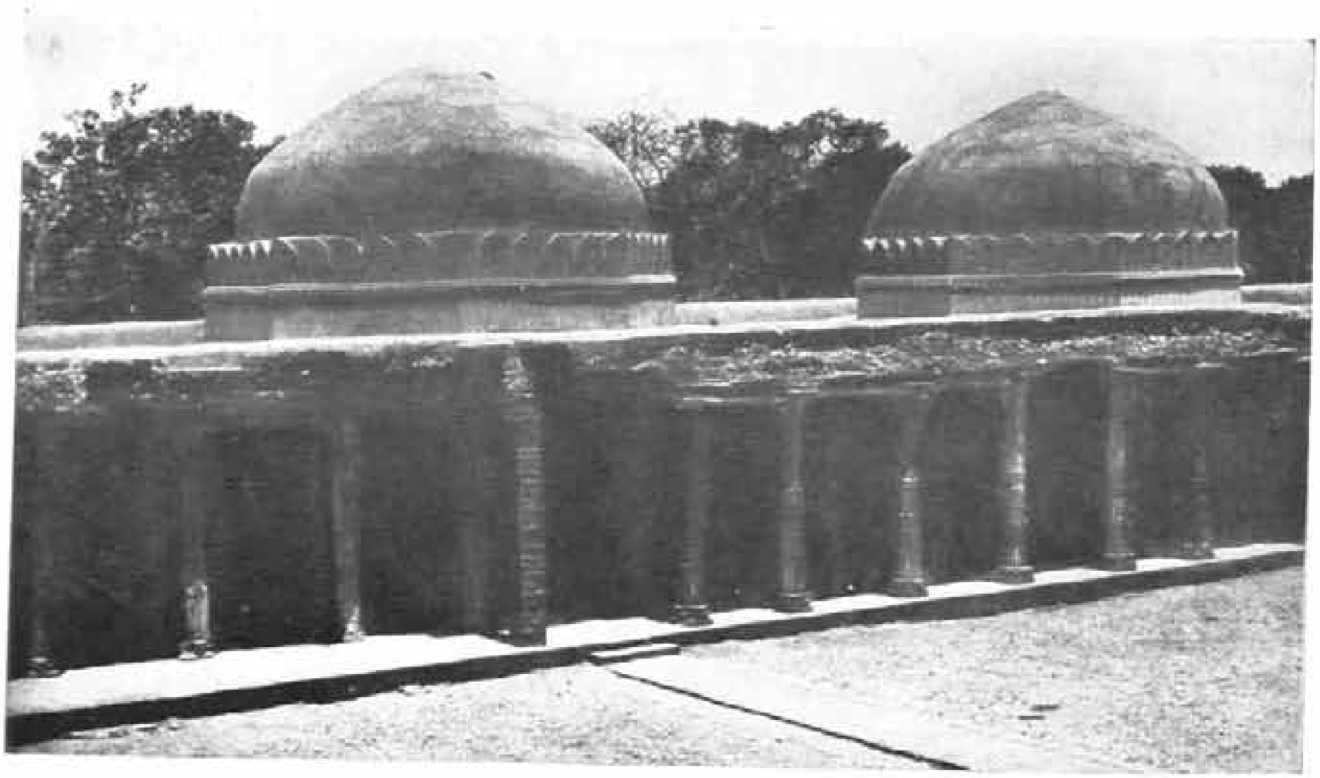


B

Mandu, Darya Khan's mosque : A, *before and* B, *after conservation* *See p. 103*

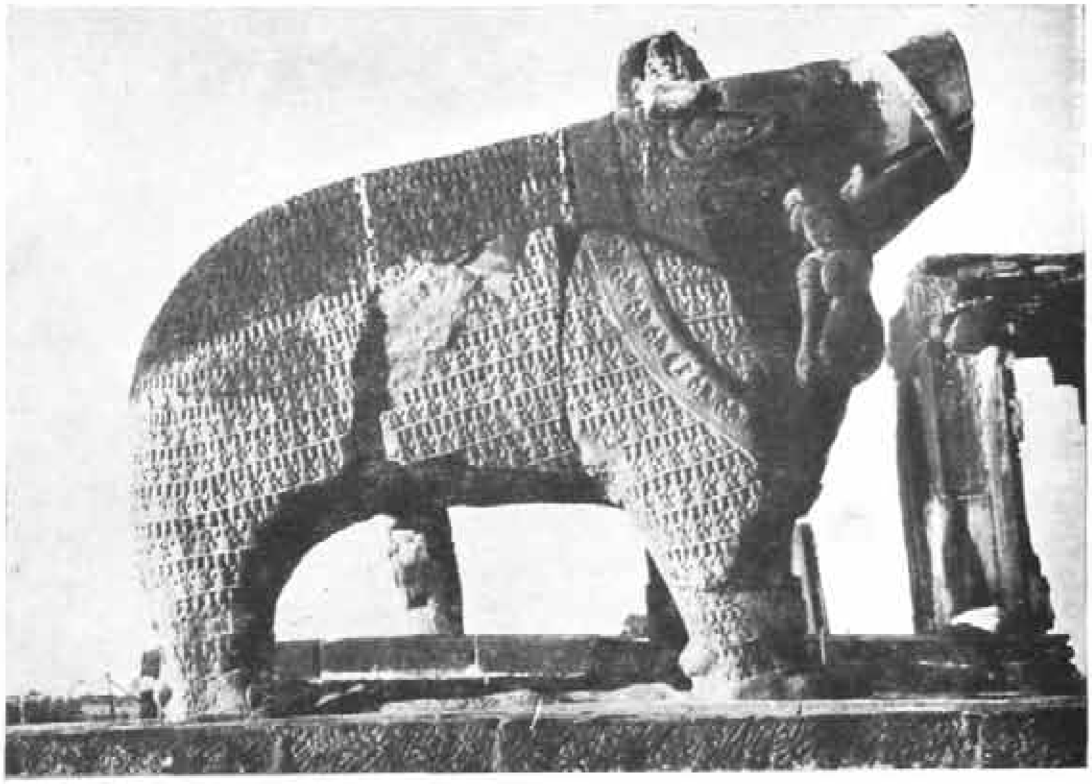


A

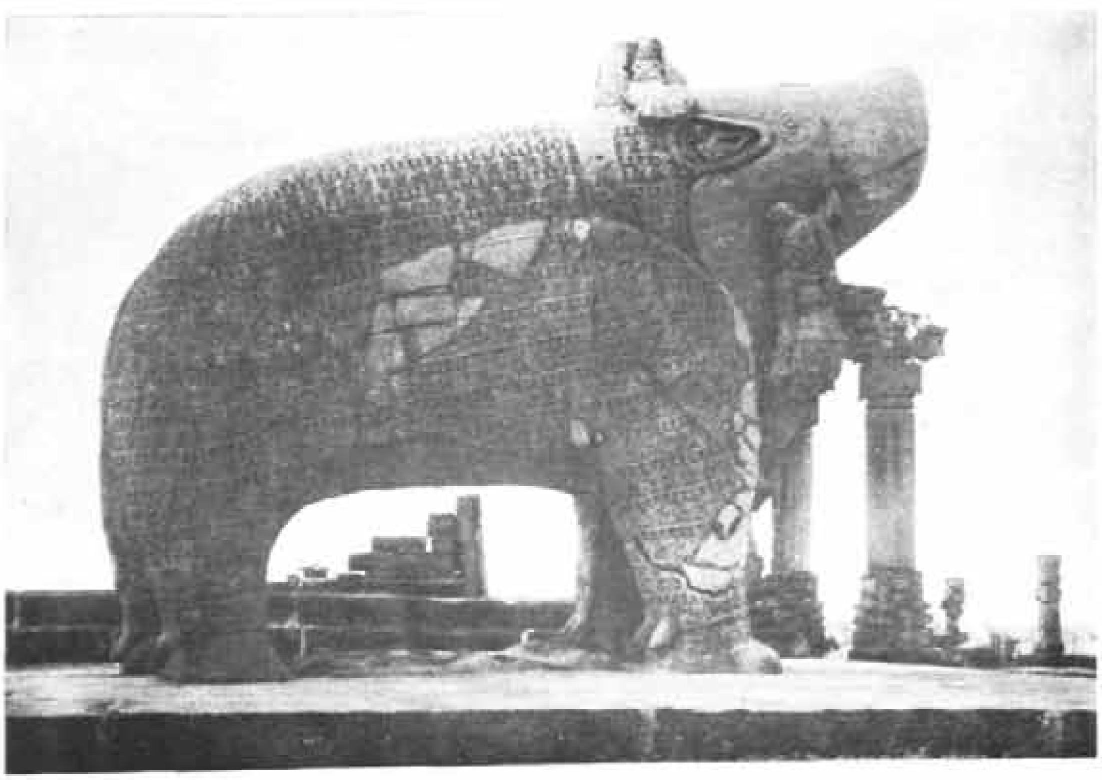


B

Mandu, Malik Mughith's mosque : A, *before and* B. *after conservation* See p. 104



A

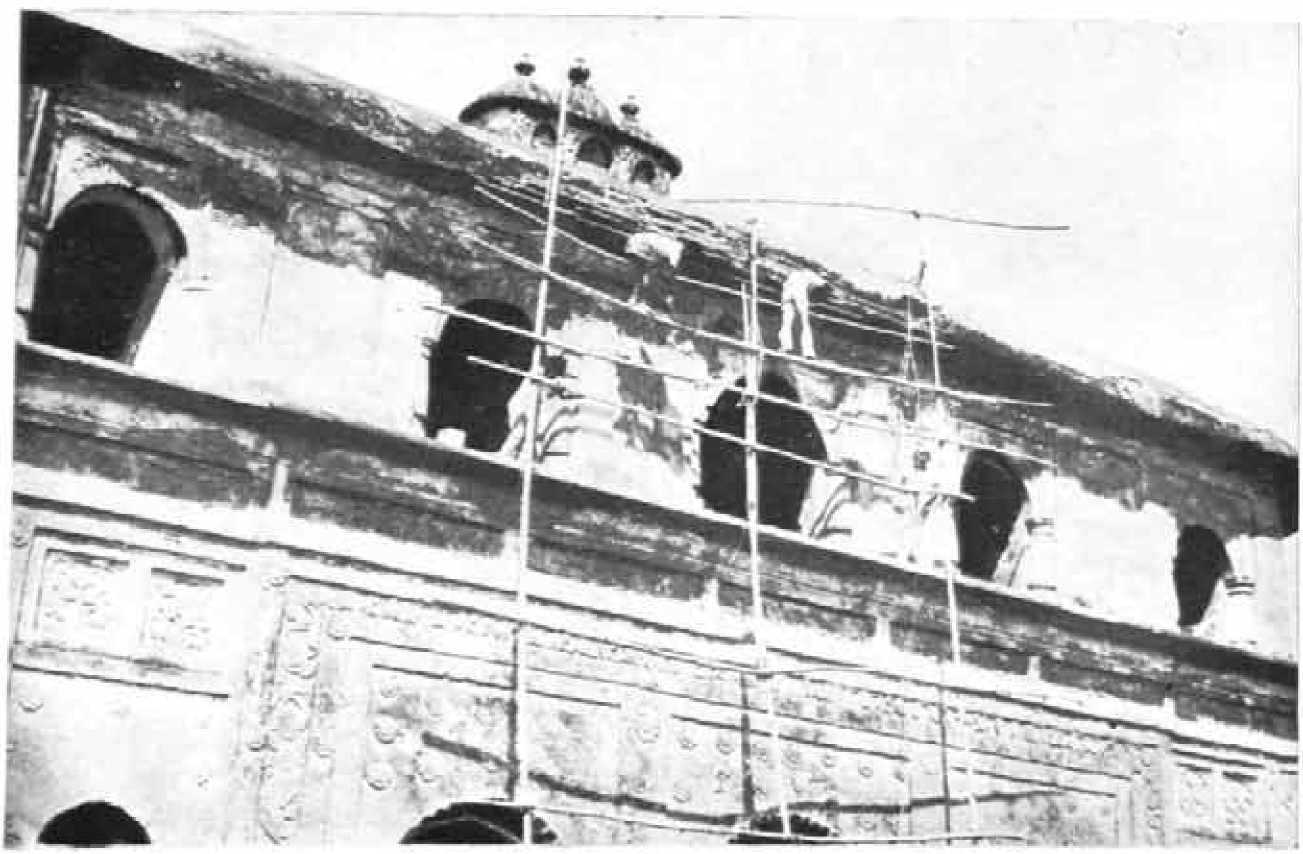


B

Eran, Varaha figure : A, *before and* B, *after conservation* *See p. 105*



A



B

Jaysagar, Ranghar pavilion : A, before and B, after conservation *See p. 107*

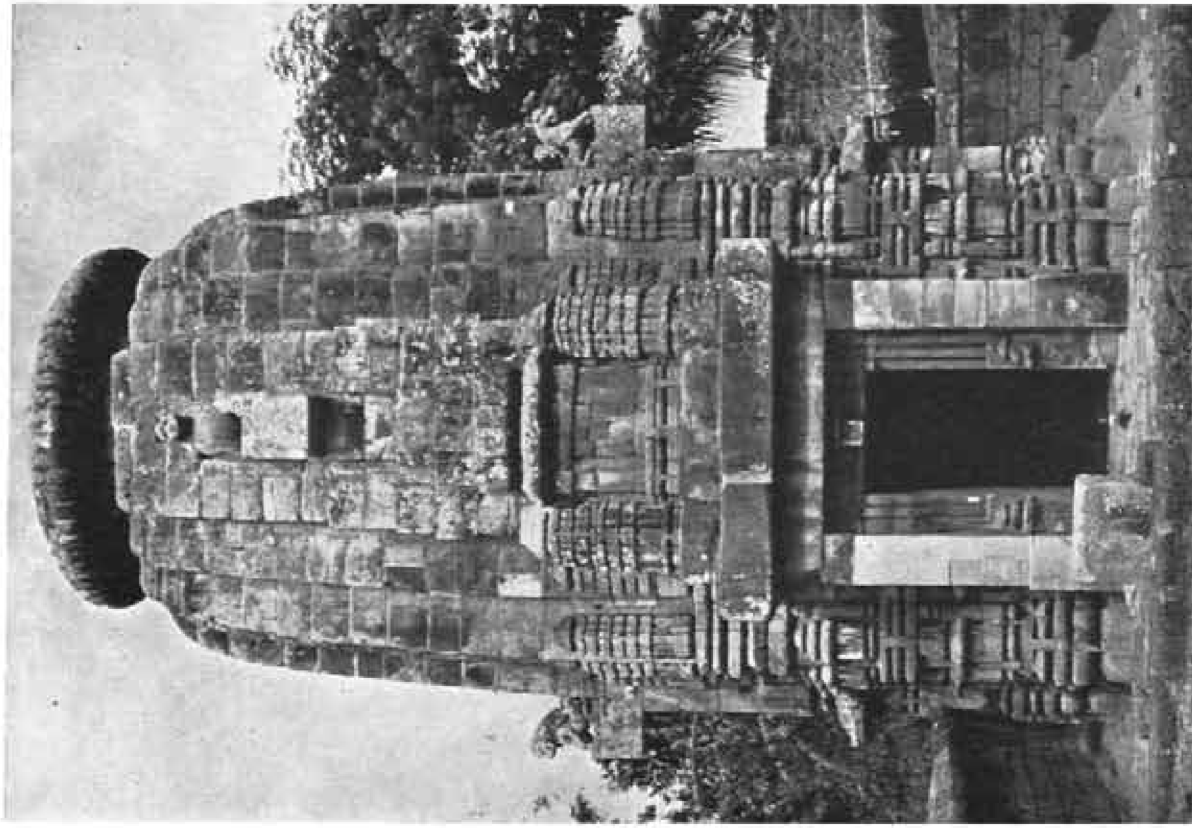


A

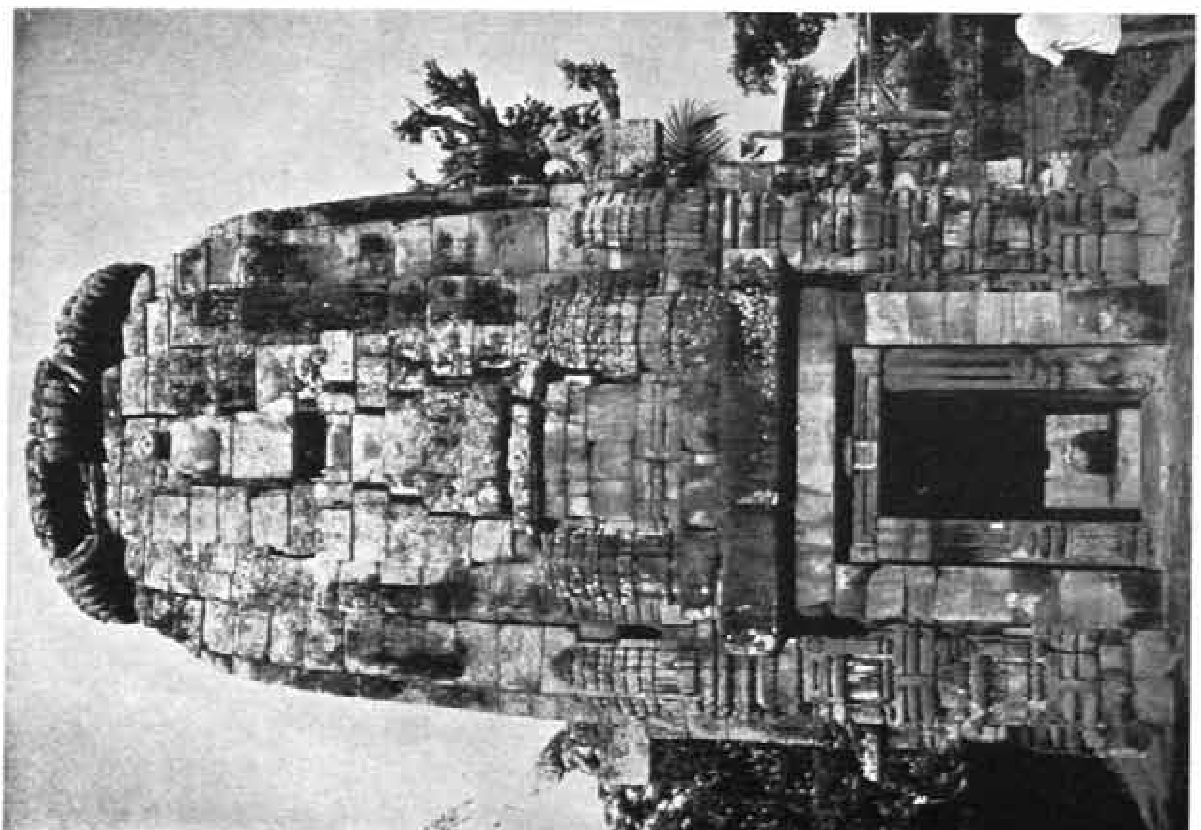


B

Bhubaneswar, Bhairavi temple : A, *before and* B, *after conservation* *See p. 108*

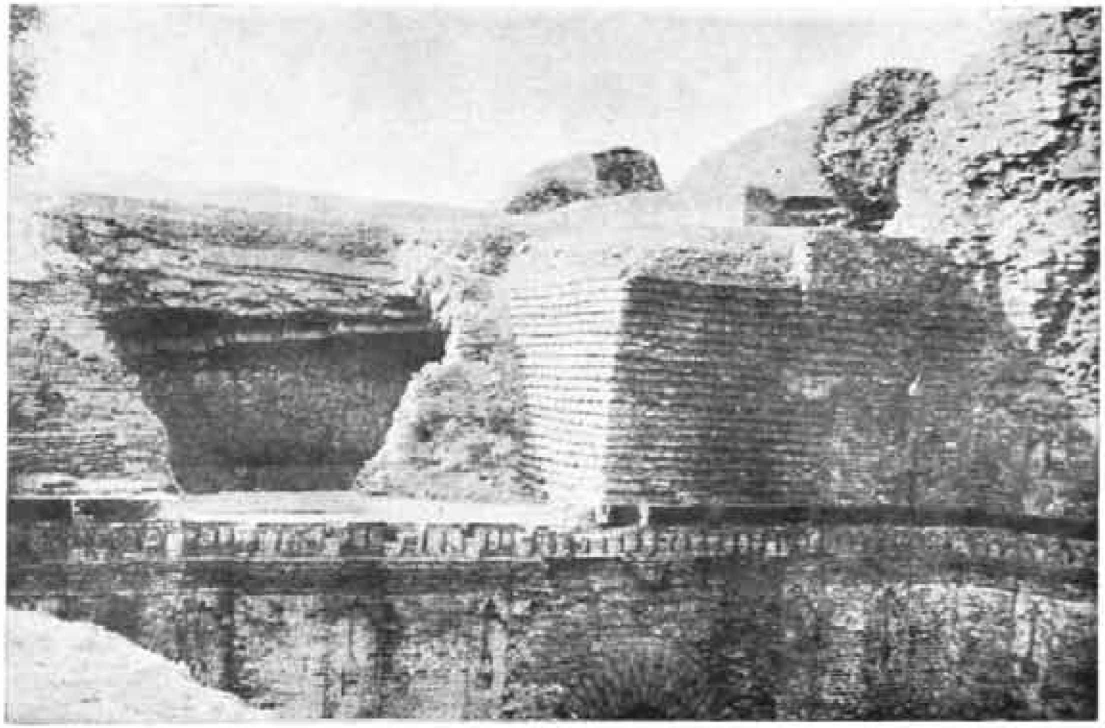


B

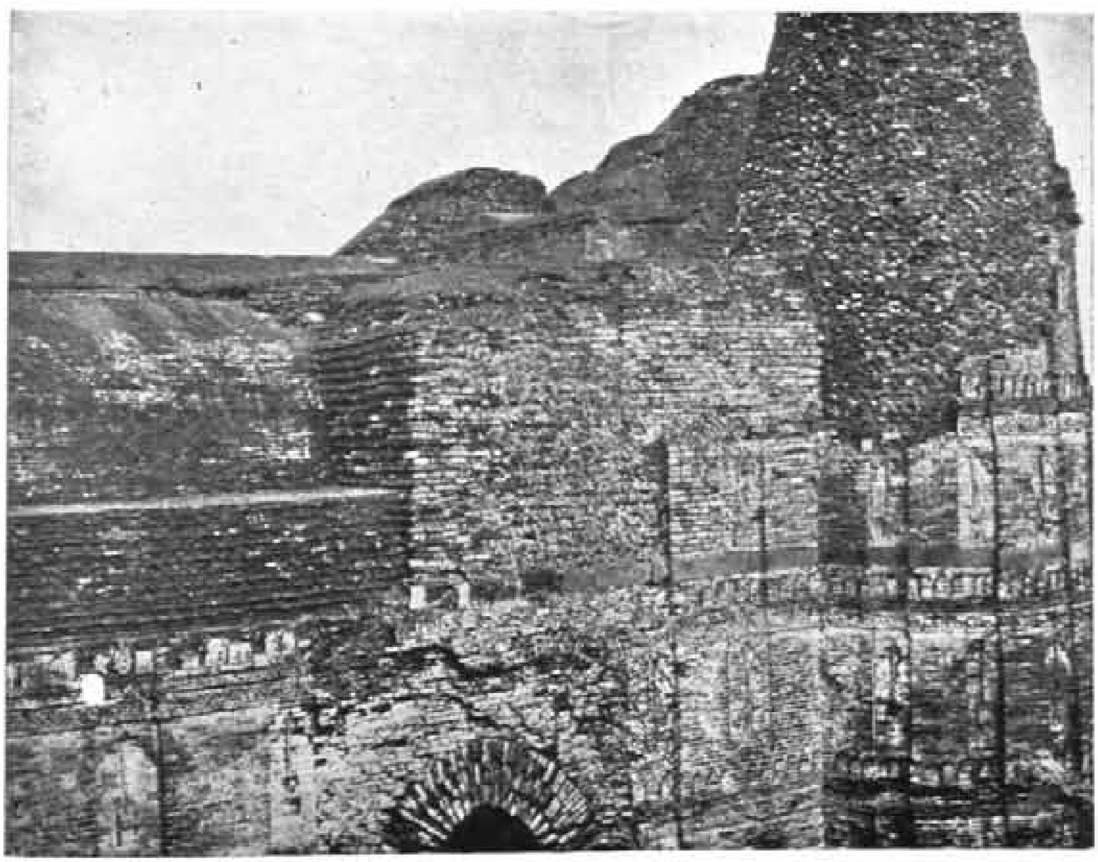


A

Bhubanesvar, Makaresvara temple-complex : A, before and B, after conservation *See p. 108*

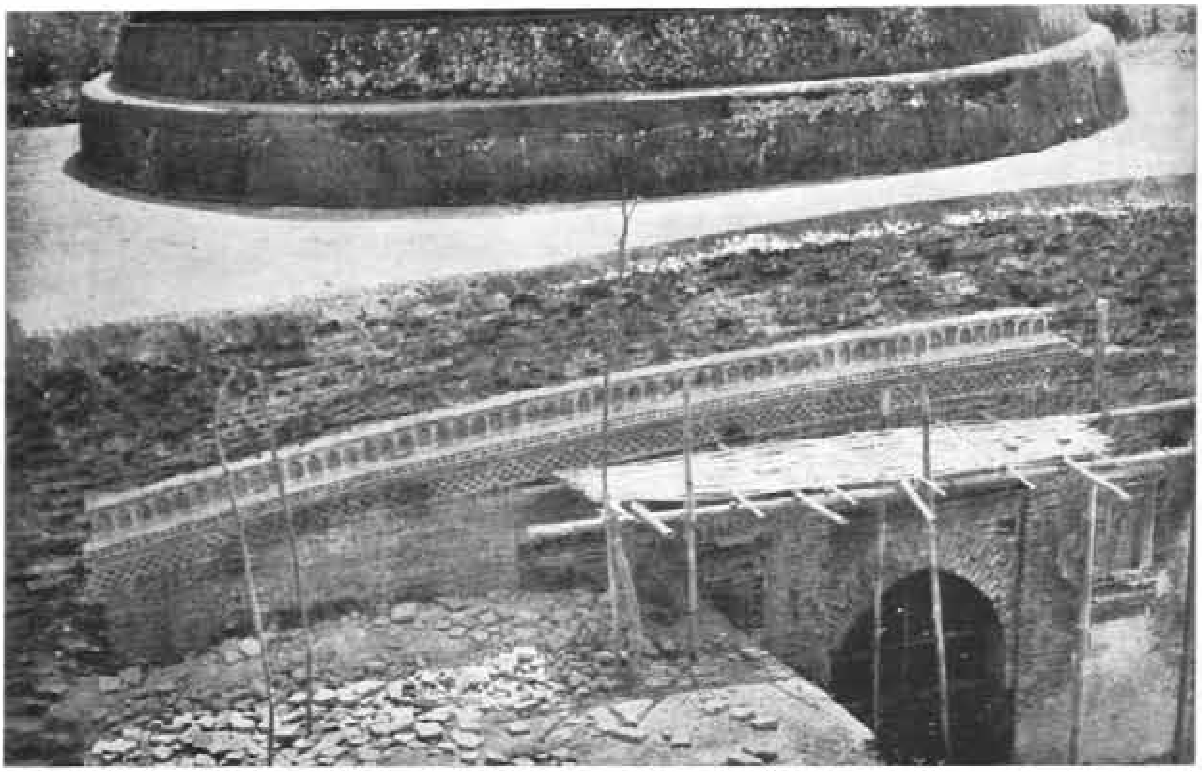


A

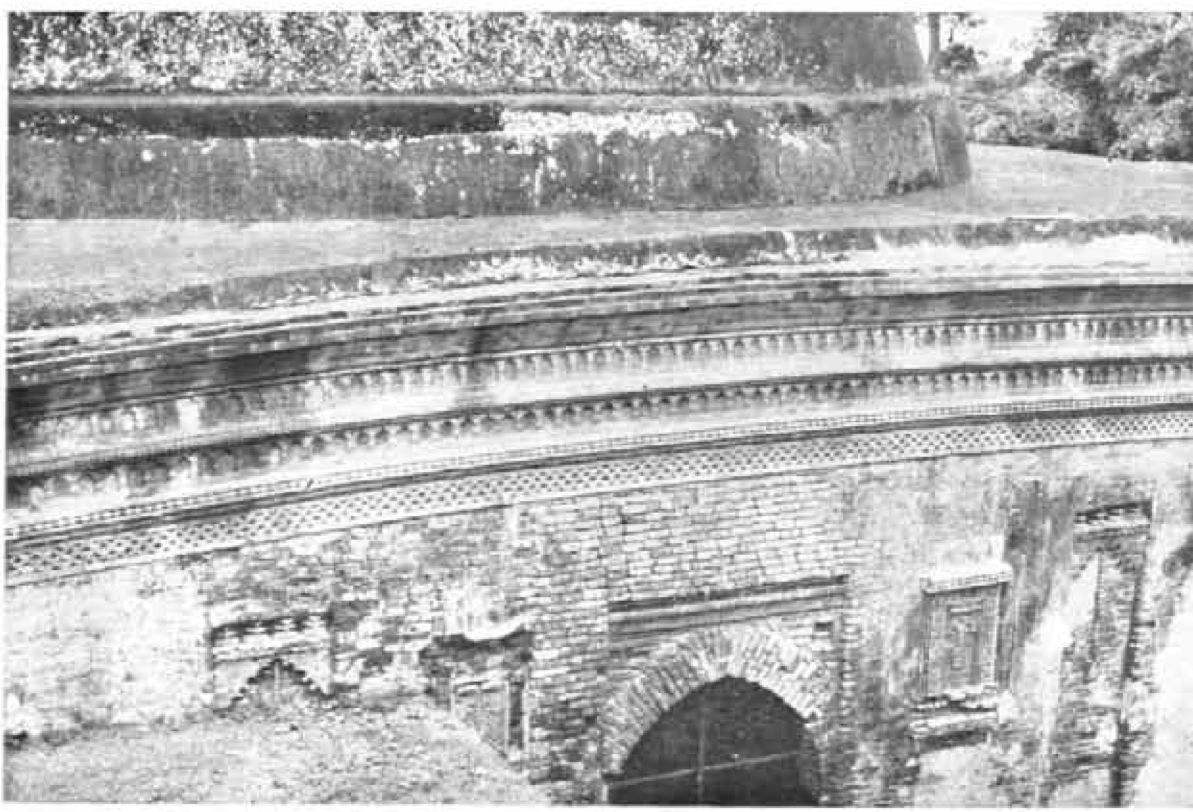


B

Gaur, Dakhil Darwaza : A, *before and* B, *after conservation* *See p. 109*



A

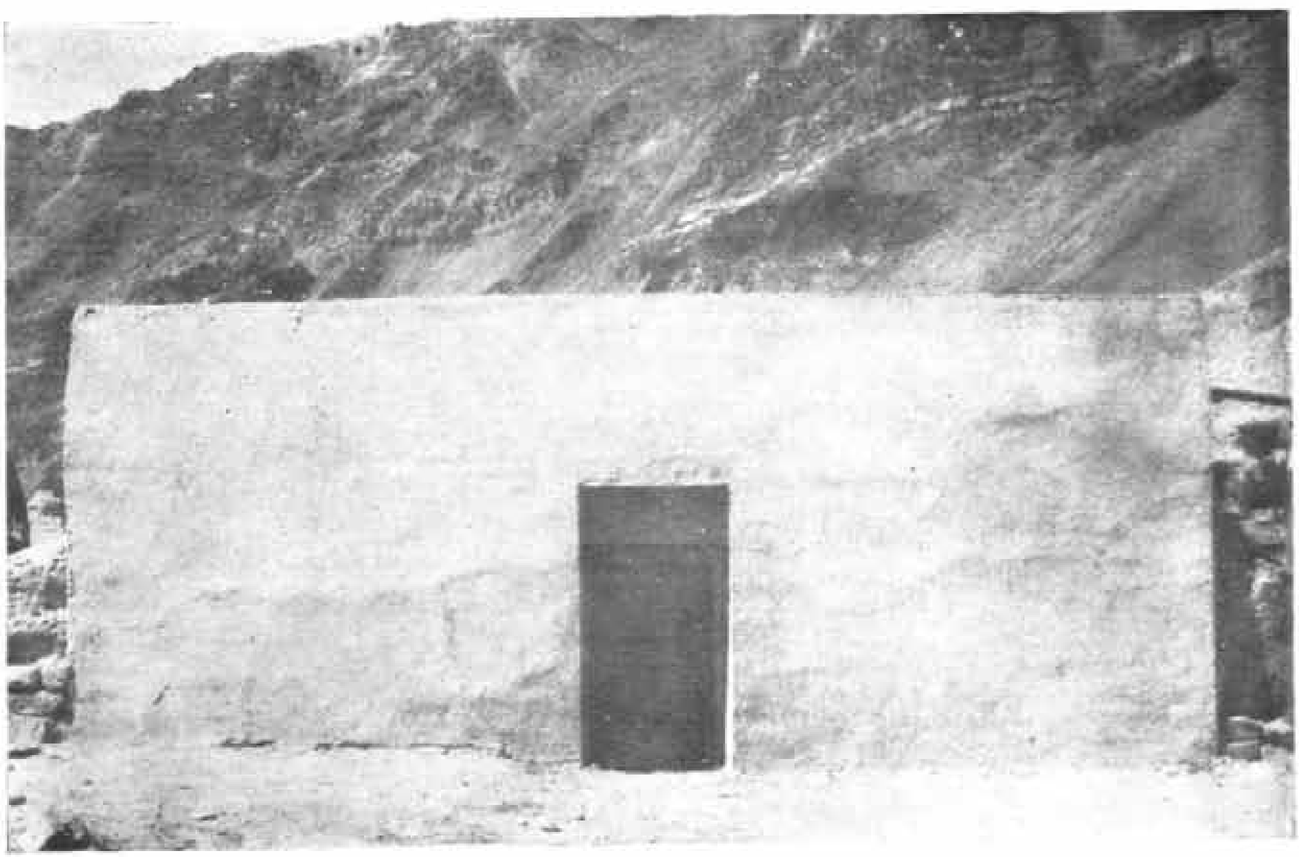


B

Gaur, Gumti gate : A, *during and* B, *after conservation* *See p. 109*



A



B

Tabo, Buddhist monastery : A. *before and* B. *after conservation* *See p. 121*

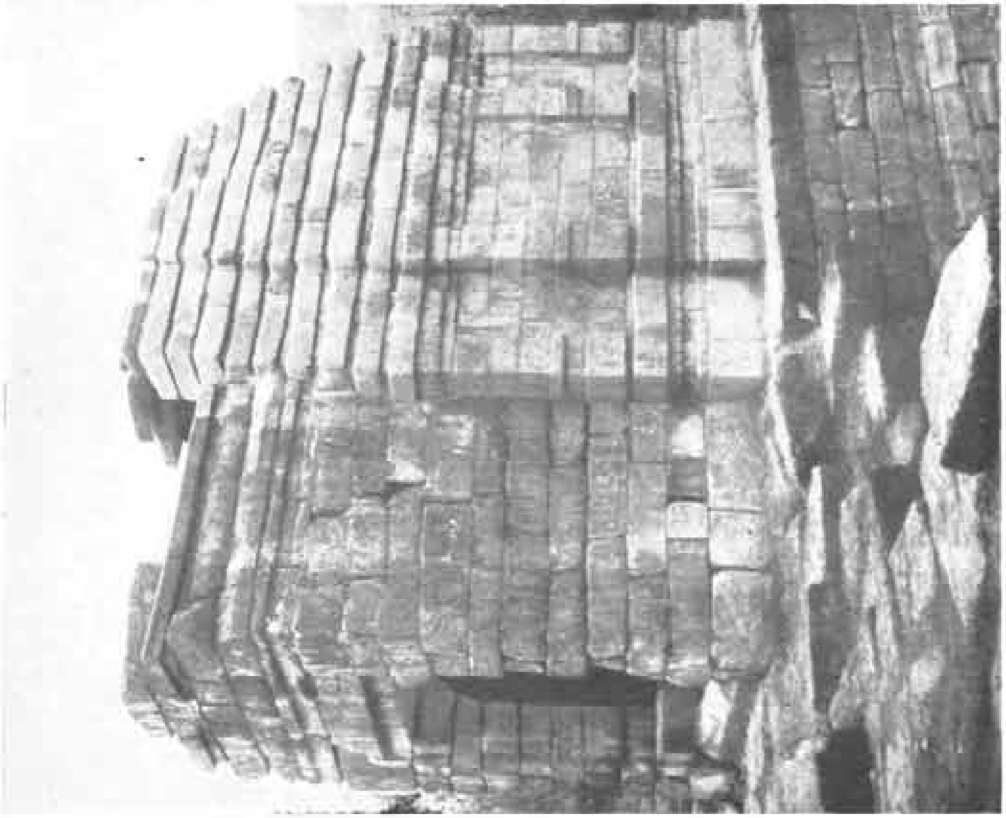


A

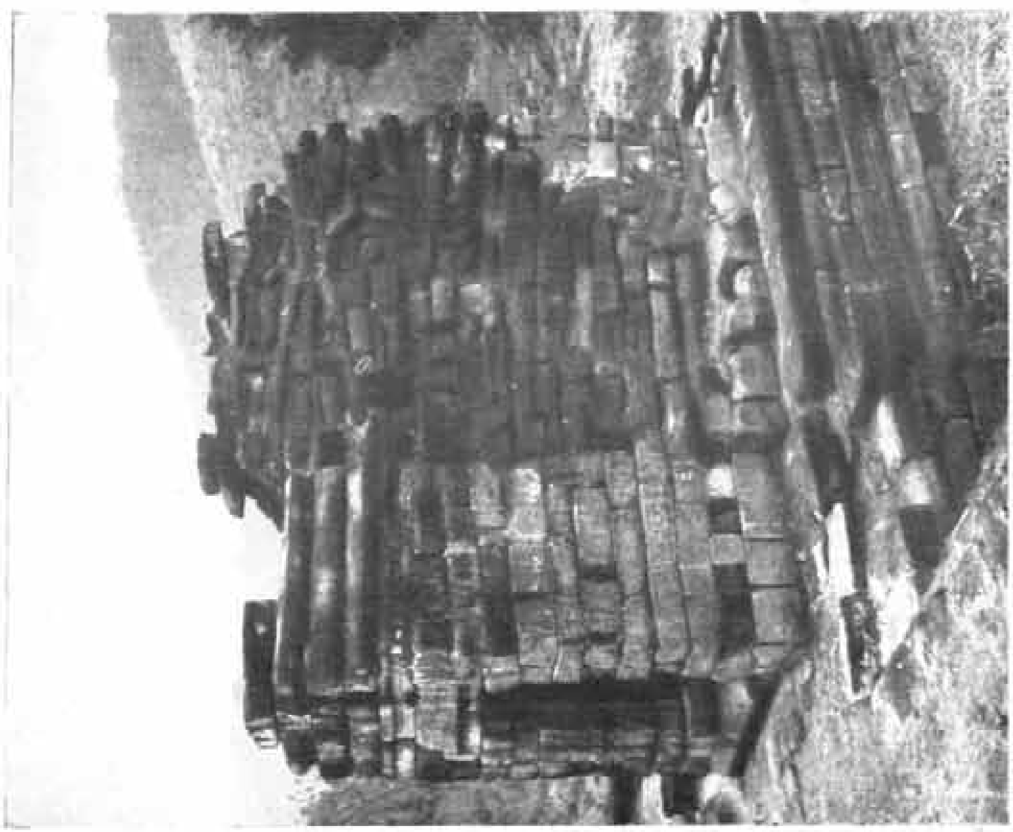


B

Krimchi, Temple no. 2 : A, before and B, after conservation See p. 123

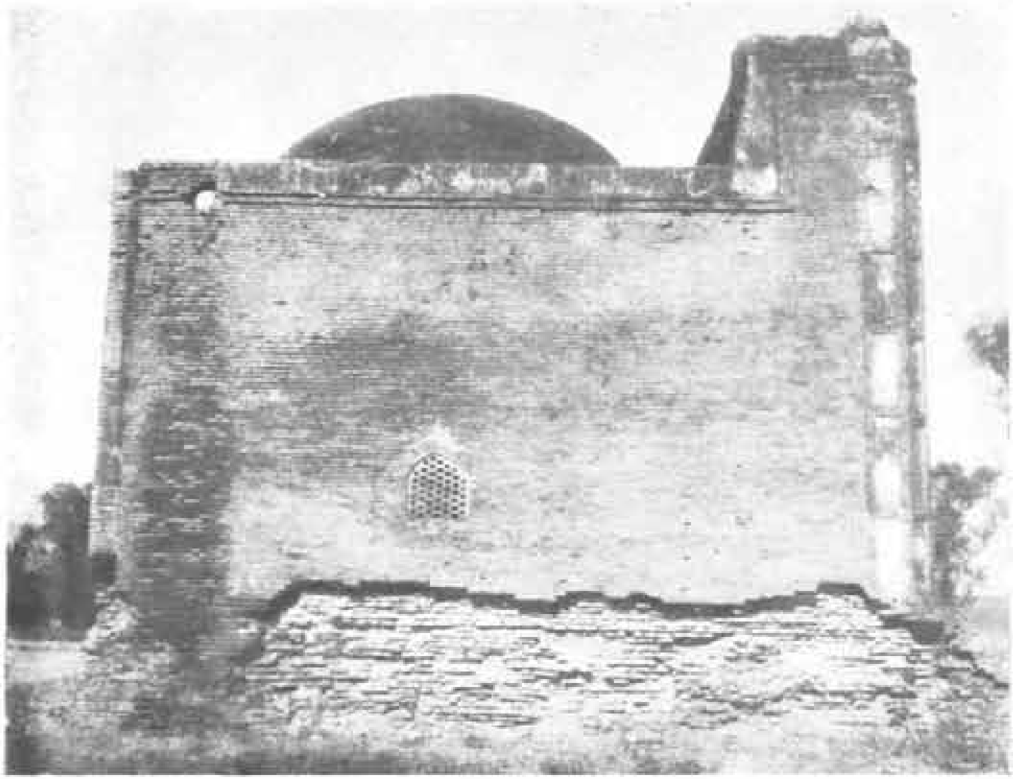


B

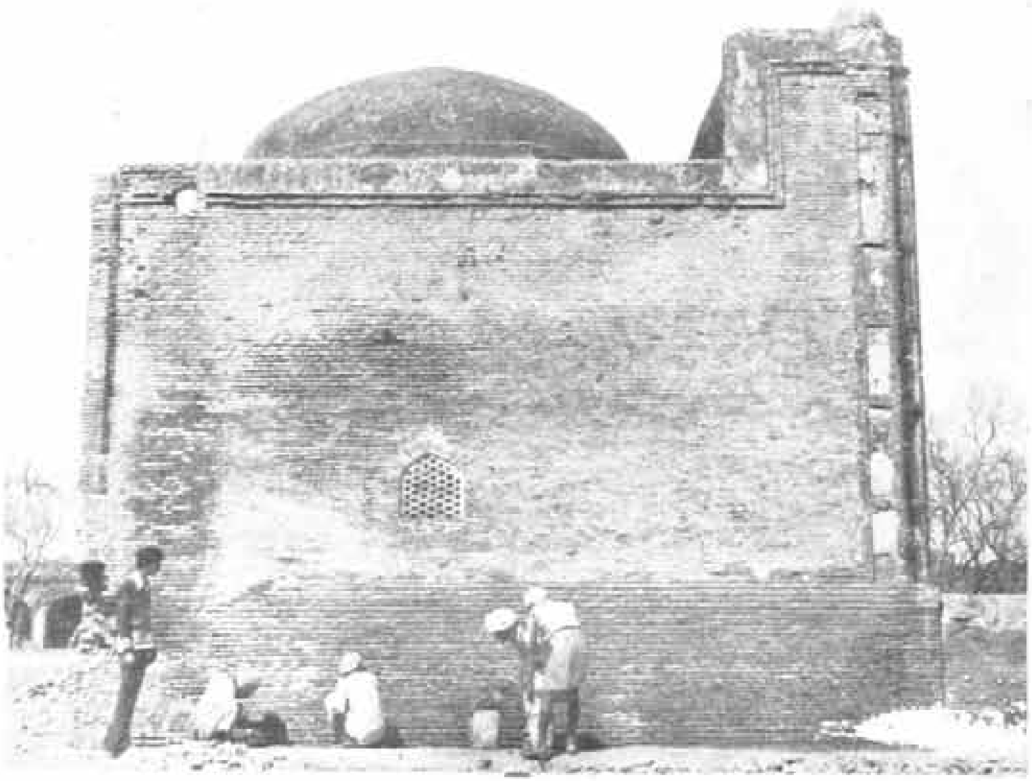


A

Kanchi, Temple no. 3 : A, before and B, after conservation *See p. 123*

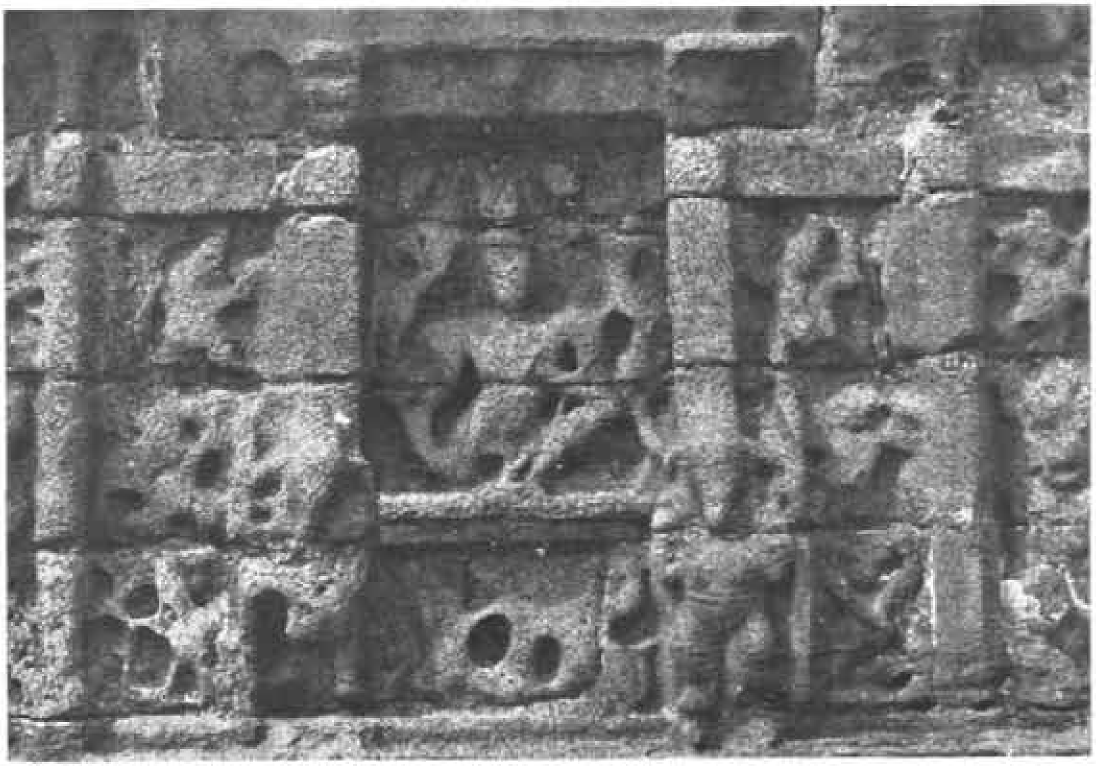


A



B

Dakhni, Dakhni-sarai : A, *before and* B, *after conservation* *See p. 123*

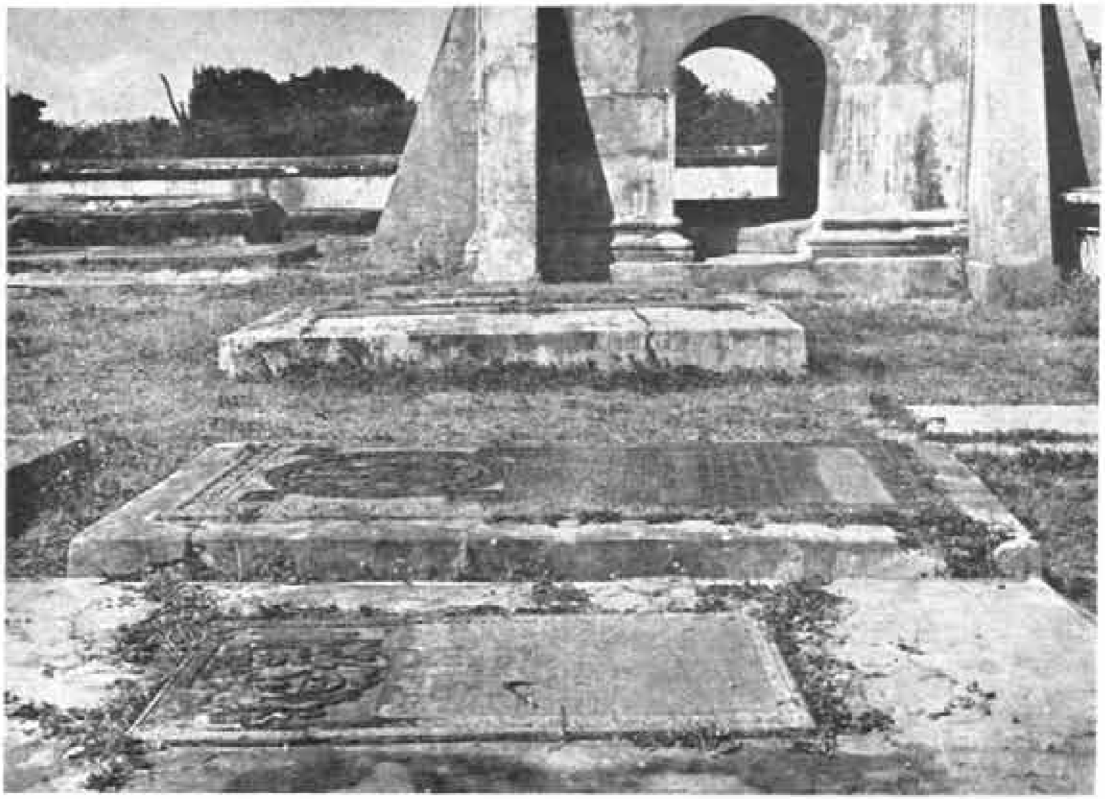


A



B

Mahabalipuram, Shore temple : A, *before and* B, *after conservation* *See p. 125*



A

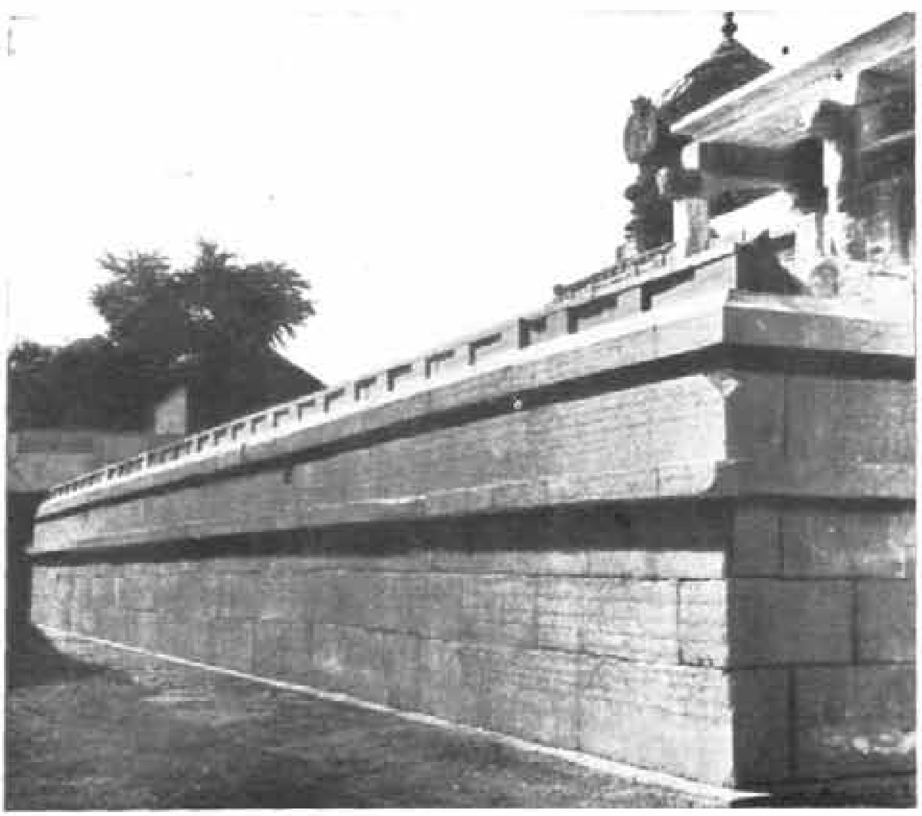


B

Pulicat, Dutch cemetery : A, before and B, after conservation *See p. 125*

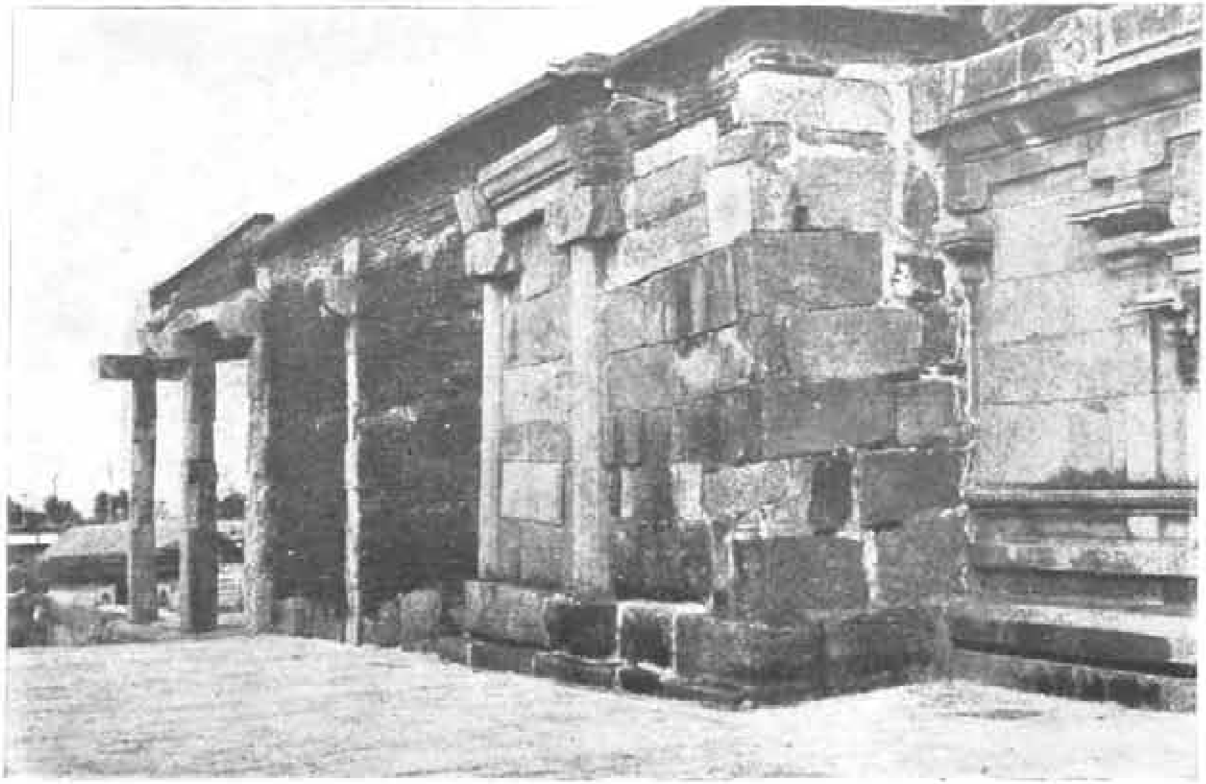


A



B

Uttaramerrur, Vaikunthanatha-perumal temple : A, during and B, after conservation. See p. 125



A



B

Uttaramerur, Vaikunthanatha-perumal temple : A, before and B, after conservation See p. 125

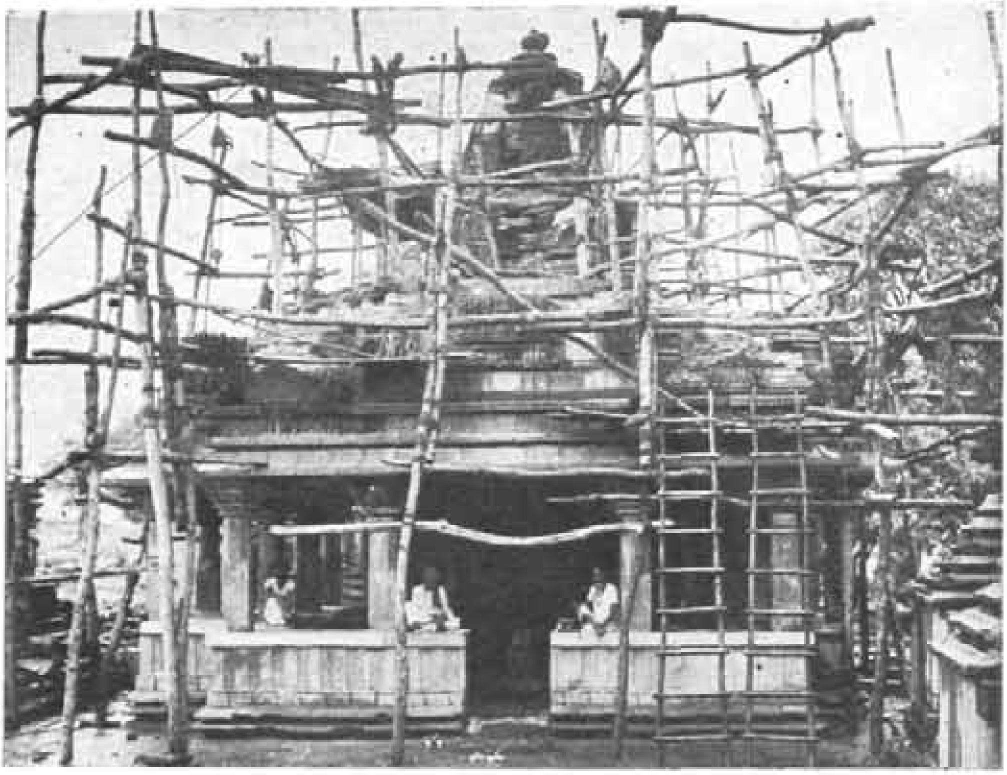


A

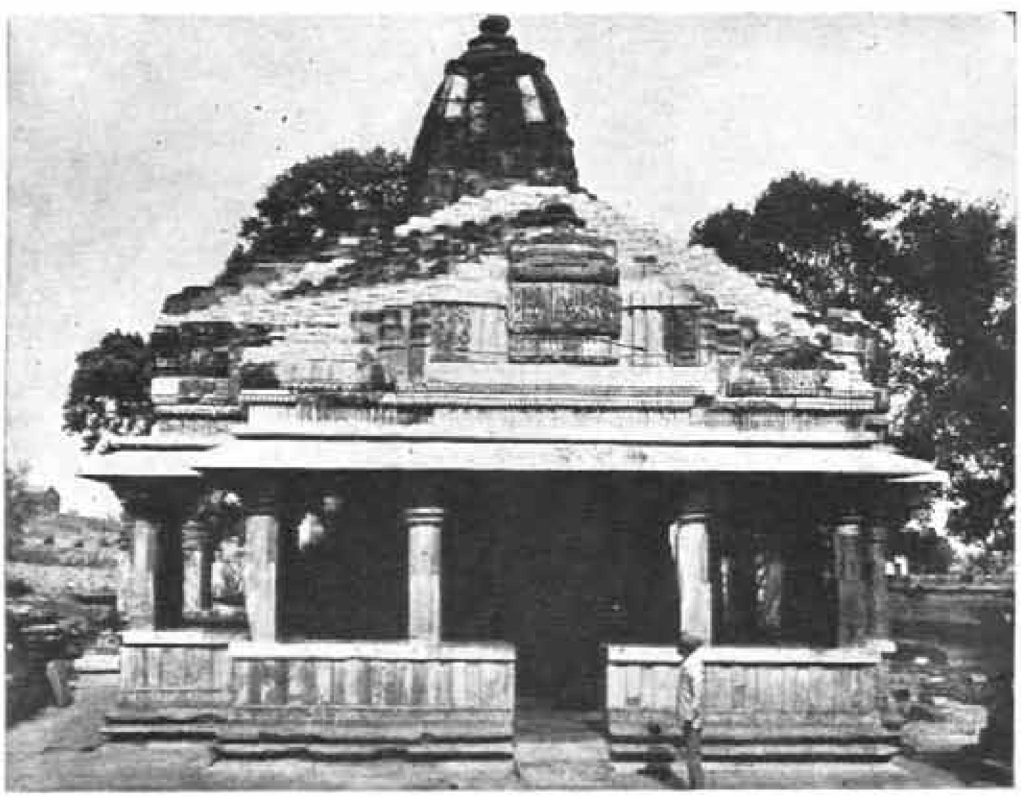


B

Pavagarh, Bawaman's mosque : A, *before and* B, *after conservation* *See p. 132*



A

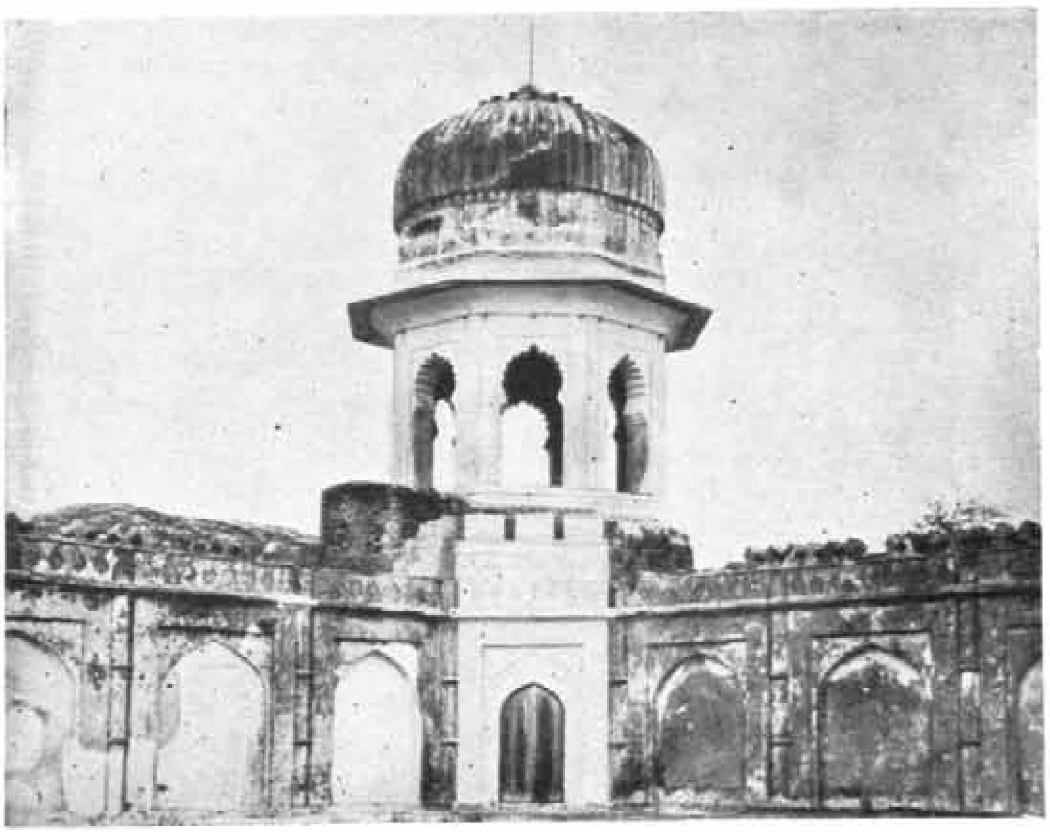


B

Arthuna, Nilakantha Mahadeva temple : A, before and B, after conservation See p. 133



A



B

Aurangabad, Bibi-ka-Maqbara : A, *before and* B, *after conservation* *See p. 130*



A



B

Dwarka, Rukmini temple : A, before and B, after conservation *See p. 132*



B



A

Gangaikondacholapuram, Brihadisvara temple : A, before and B, after removal of accretion *See p. 128*



A

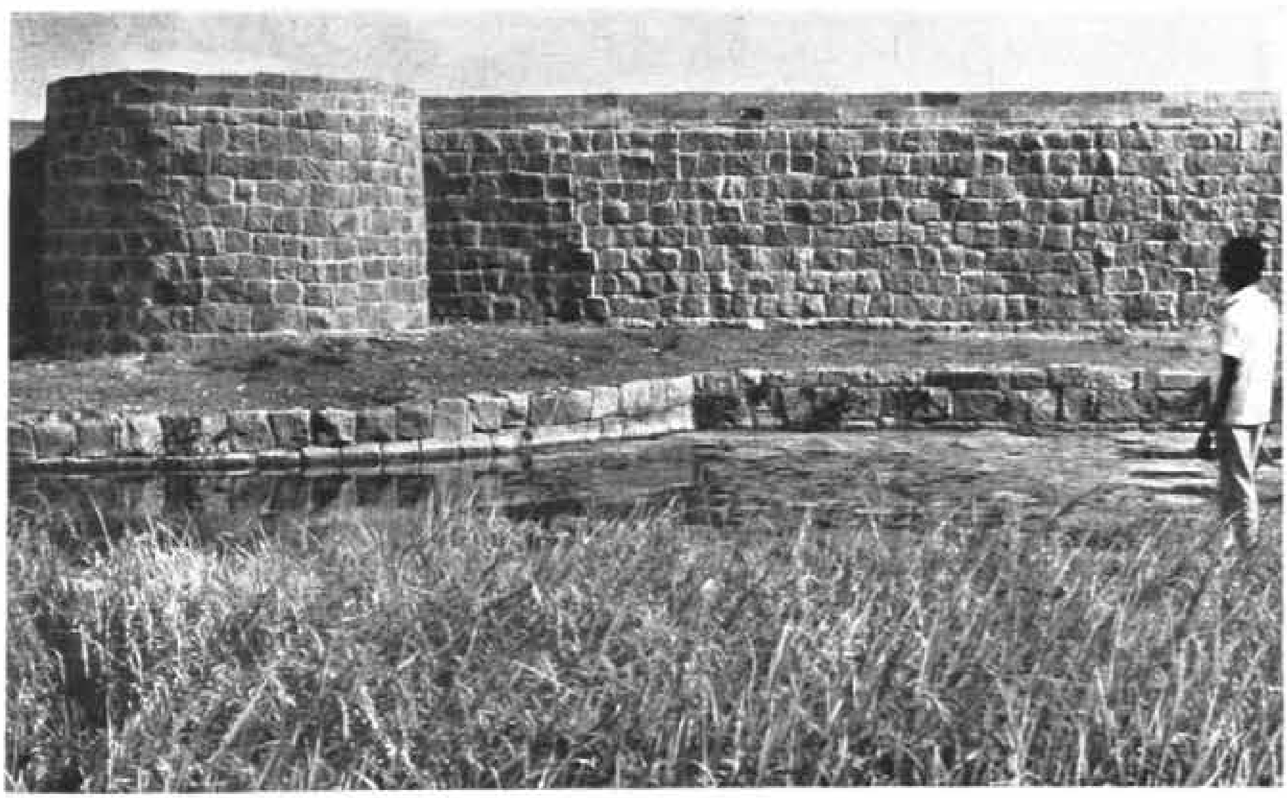


B

Ajanta, Cave 26 : A, before and B, after conservation *See p. 130*

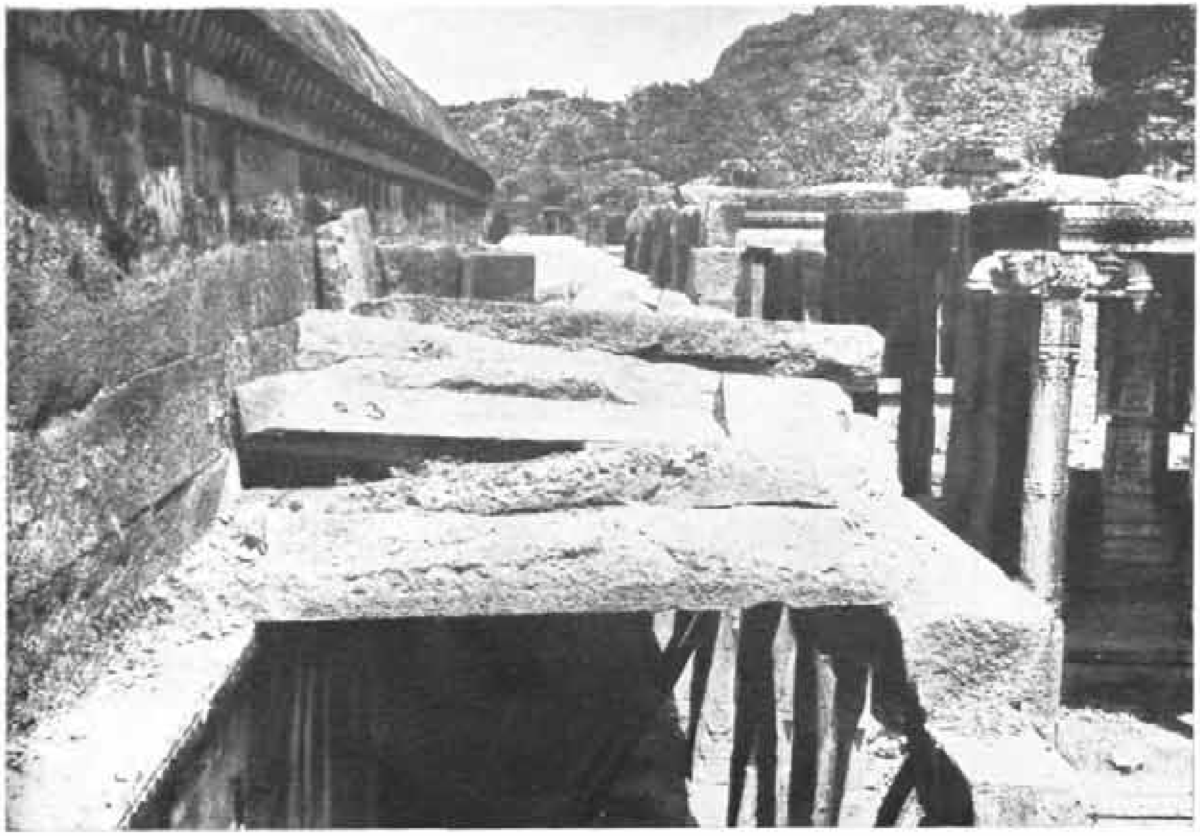


A



B

Gingee, fortification-wall : A, *before and* B, *after conservation* *See p. 127*

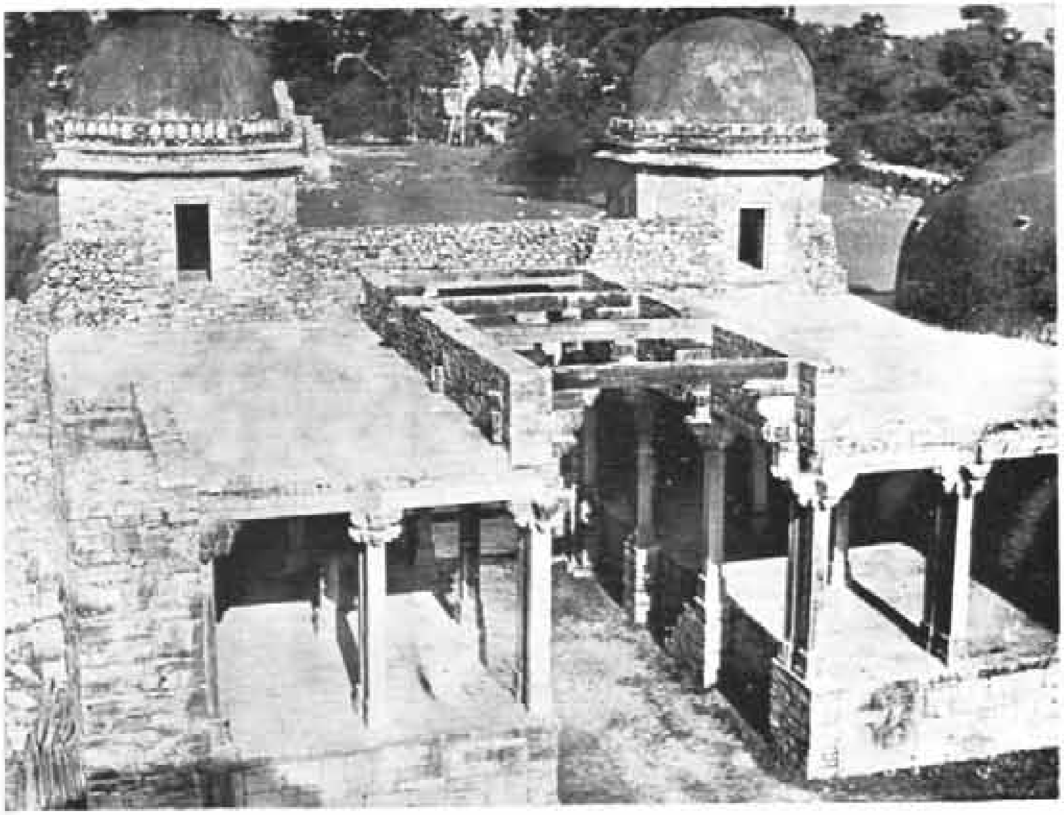


A

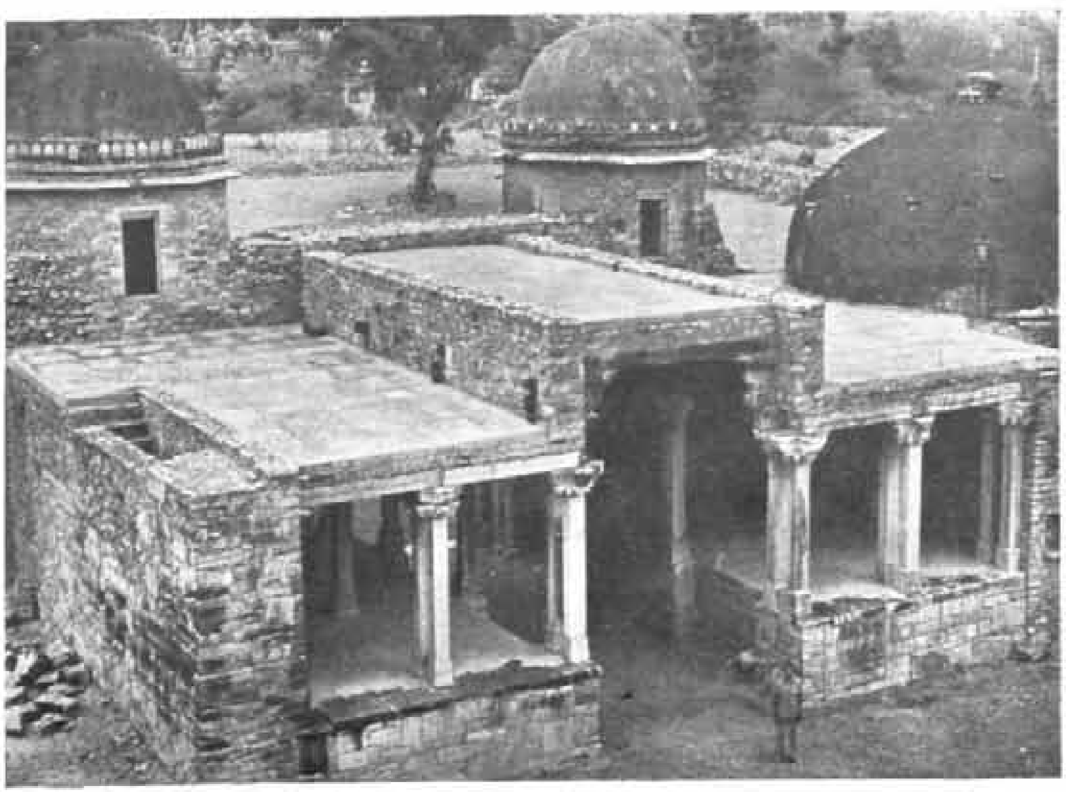


B

Gingee, Venkatarama temple : A, *before and* B, *after conservation*. See p. 127



A



B

Chittaurgarh, Tripolia gate : A, *before and* B, *after conservation* *See p. 133*



B

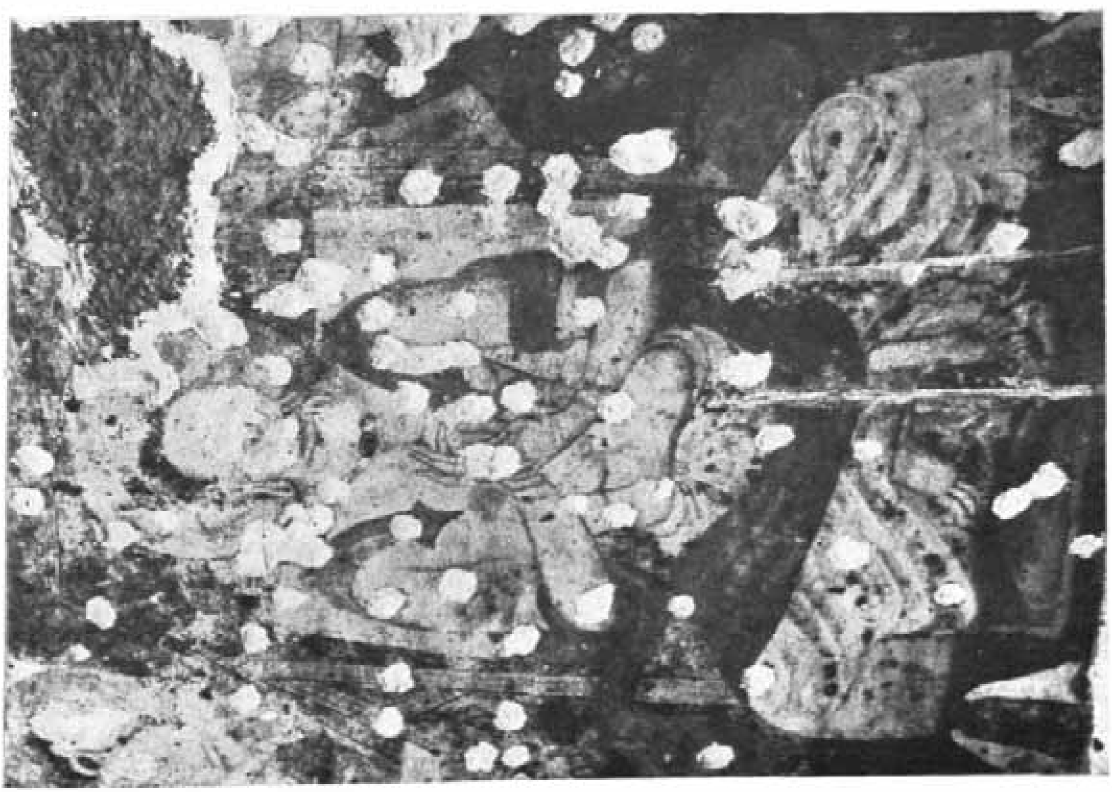


A

Bamiyan, Afghanistan : paintings in niche of Big Buddha, A, before and B, after chemical treatment *See p. 137*



B

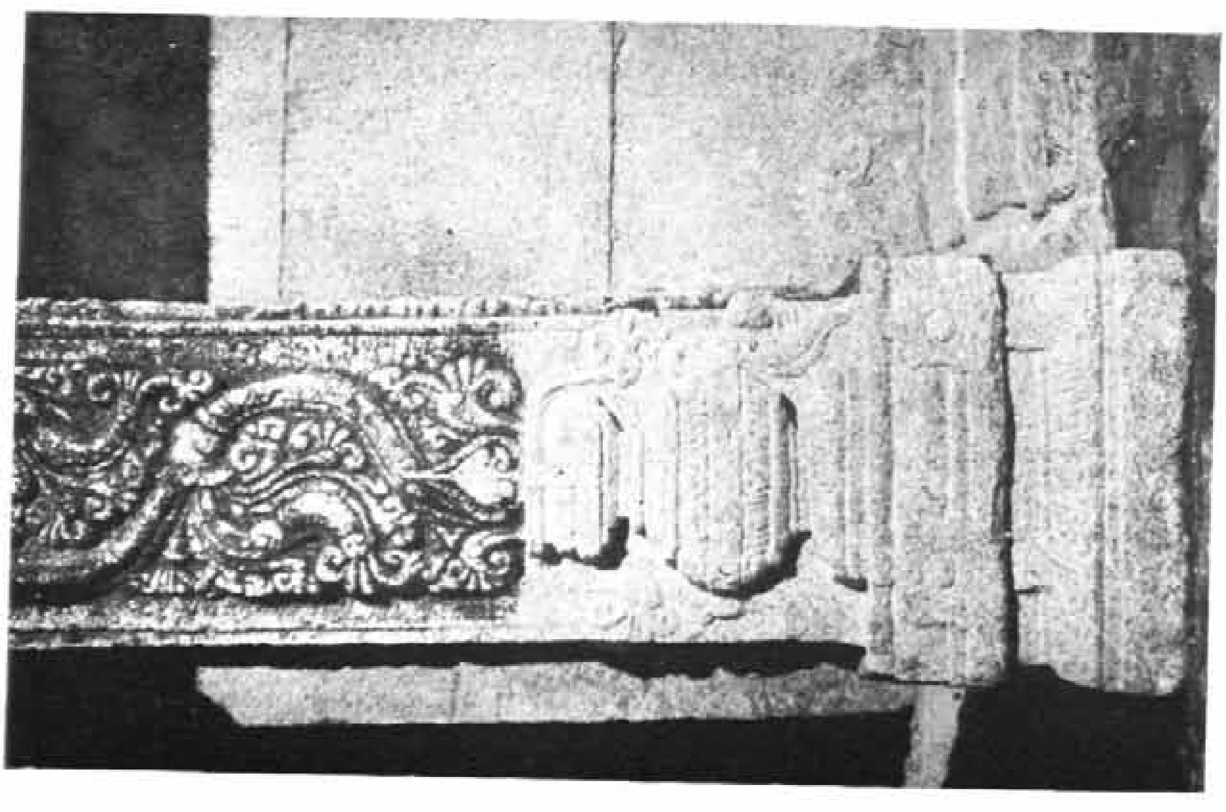


A

Bamiyan, Afghanistan : paintings in niche of Big Buddha. A, before and B, after chemical treatment *See p. 137*



B

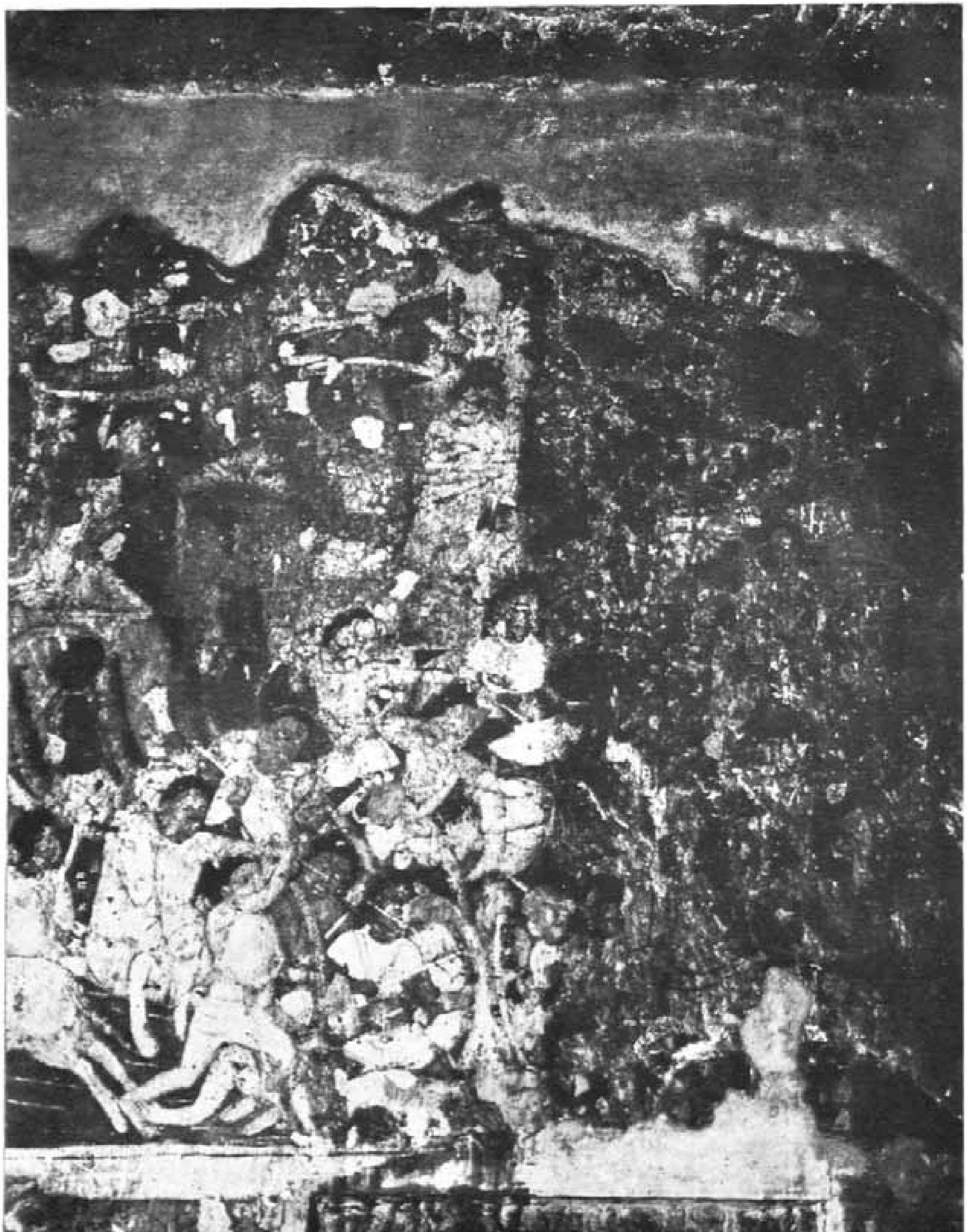


A

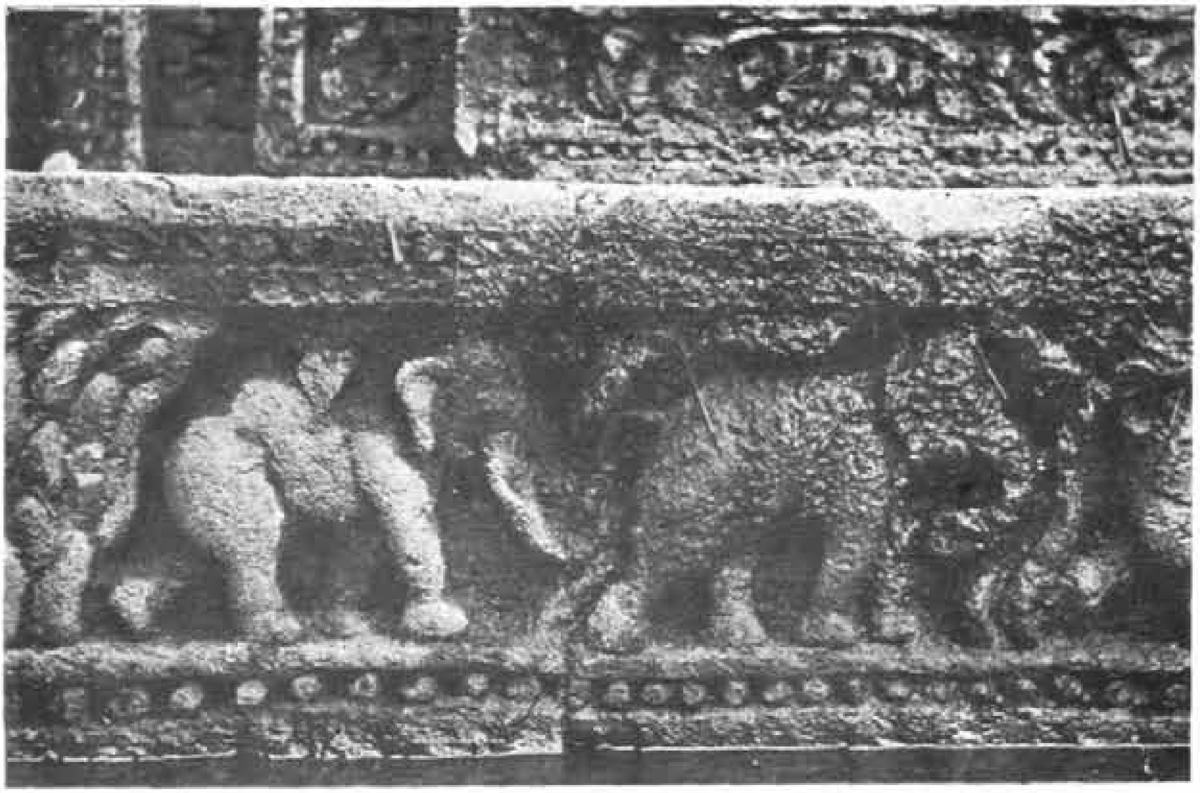
A. Lepakshi, Virabhadraswami temple, stone pillar; B, Tabo, Serlang Gompha, painted panel : during chemical treatment. See pp. 140-141



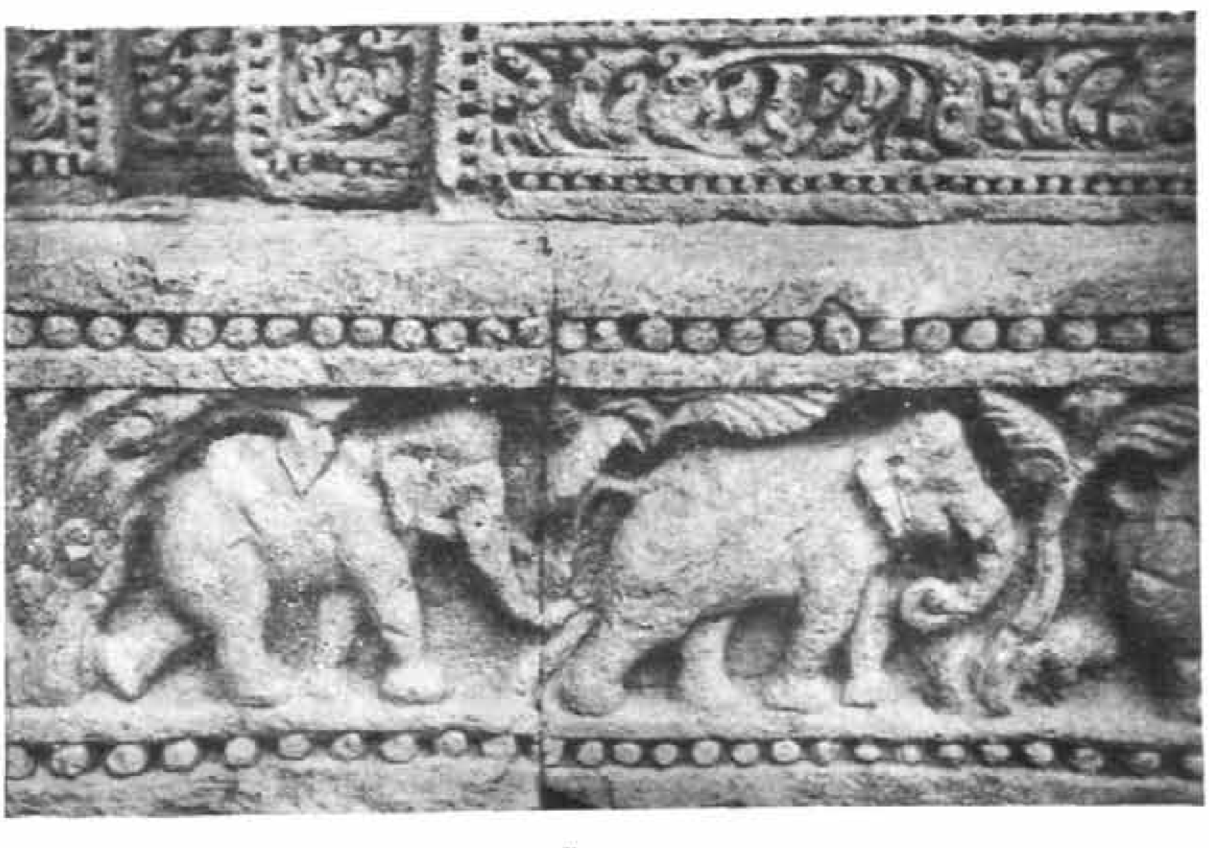
Ajanta, Cave 6 : painted panel during chemical treatment *See p. 143*



Ajanta, Cave 17 : painted panel during chemical treatment See p. 143

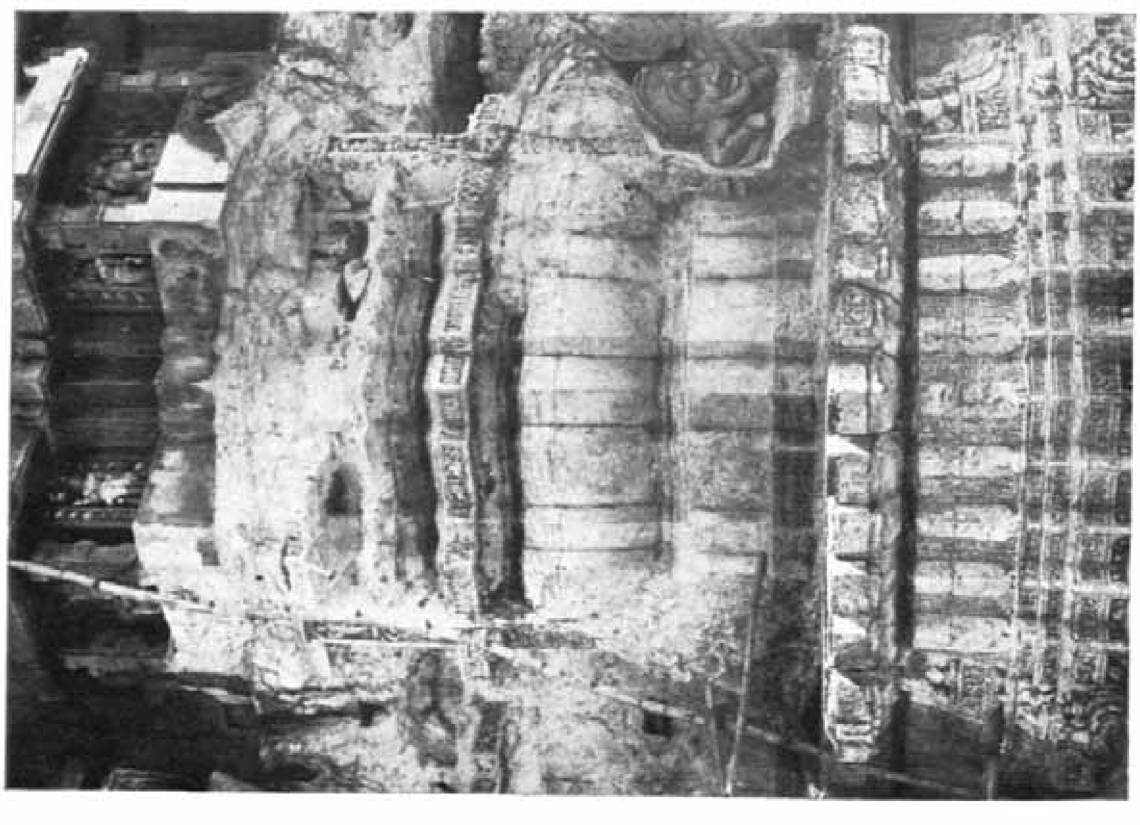


A

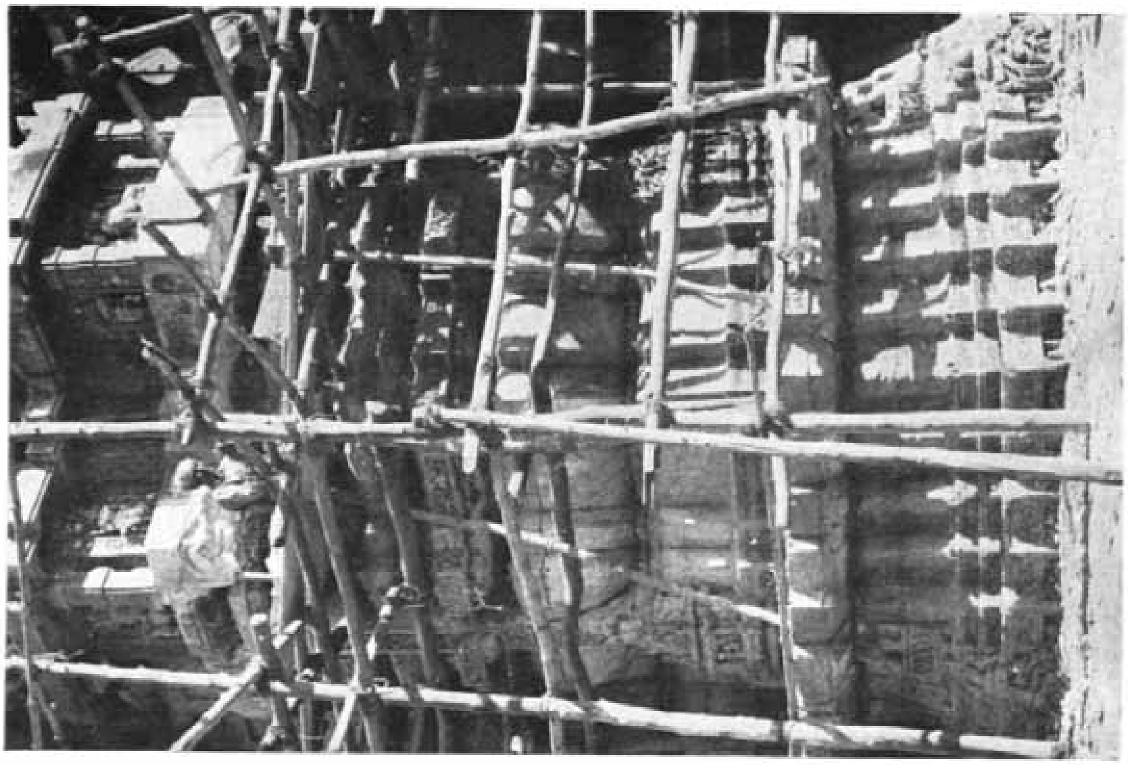


B

Konarak, Sun temple : portion of plinth, A. before and B. after chemical treatment. *See p. 144*



A



B

Puri, Lord Jagannatha temple : portion of plinth, A, before and B, during chemical treatment *See p. 144*